Supreme Court, U.S.
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No.

In The
Supreme Court of The United States
October Term 1996

PSI REPAIR SERVICES, INCORPORATED,
Petitioner,

v.

HONEYWELL, INCORPORATED,
a foreign corporation,
Respondent.

Petition For A Writ Of Certiorari To The United States Court of Appeals For The Sixth Circuit

PETITION FOR WRIT OF CERTIORARI

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QUESTION PRESENTED FOR REVIEW

Whether the maintenance of a stated parts-restrictive policy eliminates the possibility of market power, as a matter of law, in the aftermarkets for a specific brand of equipment in a case nearly identical to Eastman Kodak Co. v. Image Technical Services, Inc., 504 U.S. 451 (1992).

PARTIES TO THE PROCEEDING

All of the parties to the proceeding are listed in the caption.

Petitioner, PSI Repair Services, Inc., has no non-wholly owned subsidiaries. The parent corporation of PSI Repair Services, Inc. is Phillips Service Industries, Inc.

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IN THE SUPREME COURT OF
THE UNITED STATES

PSI REPAIR SERVICES, INC.	)	
	)	
Petitioner	)	
	)	
vs.	)	
	)	
HONEYWELL, INC.	)	
	)	Petition for Writ
Respondent	)	of Certiorari to
	)	the United
	)	States Court of
	)	Appeals for the
	)	Sixth Circuit

PETITION FOR WRIT OF CERTIORARI

PSI Repair Services, Inc. ("PSI") respectfully requests that a writ of certiorari issue to review the judgment of the United States Court of Appeals for the Sixth Circuit in this case.

OPINIONS BELOW

The opinion of the United States Court of Appeals for the Sixth Circuit is reported at 104 F.3d 811 (6th Cir. 1997) and is reproduced in the Appendix ("App.") attached to this Petition at App. A. The opinions of the United States District Court for the Eastern District of Michigan, granting defendant's Motion for Summary Judgment, are unreported and are reproduced at Apps. B and C.

STATEMENT OF JURISDICTION

The judgment of the Court of Appeals was entered on January 13, 1997 (App. A). The jurisdiction of this Court is invoked under 28 U.S.C. § 1254(1).

STATUTORY PROVISIONS INVOLVED

The statutes involved are set forth in the Sherman Act, 15 U.S.C. § 1 and § 2. The text of both sections is set forth in App. E.

STATEMENT OF THE CASE

Pursuant to a series of agreements, Respondent Honeywell, Inc. ("Honeywell") restricts computer chip

manufacturers from selling chips or "parts," unique to its equipment, to any of its customers or independent service organizations- so called "ISOs". (Court of Appeals' Appendix or C.A.App. 1331-1332). Petitioner PSI Repair Services, Inc. ("PSI"), an ISO, has alleged that Honeywell uses its control over these parts to limit the choices available to consumers for the service of Honeywell equipment. Under the Sherman Act, PSI claims Honeywell has created an unlawful tying arrangement and has monopolized the markets for parts and service. On March 24, 1993, PSI filed a complaint against Honeywell in the United States District Court for the Eastern District of Michigan, asserting violations of Sections 1 and 2 of the Sherman Act. Subject matter jurisdiction vested with the district court in accordance with 15 U.S.C. § 1 et seq., 15 U.S.C. § 15, and 28 U.S.C. § 1331, based upon federal question jurisdiction, and upon the diversity of citizenship between the parties pursuant to 28 U.S.C. § 1332.

On March 9, 1995, the district court granted Honeywell's motion for summary judgment on all claims of the complaint. PSI filed its notice of appeal on March 21, 1995. The Court of Appeals for the Sixth Circuit reviewed the district court's final judgment based on 28 U.S.C. § 1291. On January 13, 1997, it issued its opinion upholding the district court's judgment on different grounds from those relied upon by the district court. The opinion

specifically rejected the district court's conclusions, affirming only the result.

A. Overview and Summary

This case involves a matter of substantial commercial importance which has been decided in a manner that directly conflicts with this Court's decision in Eastman Kodak Co. v. Image Technical Services, Inc., 504 U.S. 451 (1992).

In Kodak, this Court held that market power can exist in the aftermarkets for parts and service for a single brand of equipment even if competition exists in the equipment market. Kodak, 504 U.S. at 477-478. This ruling was buttressed to the economic principle that market imperfections, such as switching costs and information costs, can insulate monopoly power in the aftermarkets from the effects of competition in the equipment market. Kodak, 504 U.S. at 473.

Based upon this economic principle and this Court's holding in Kodak, PSI filed its antitrust action, alleging tying and monopolization under the Sherman Act. Essentially, PSI contends that Honeywell has market power in the aftermarket for its brand of industrial automation control equipment. As in Kodak, this market power derives not from any inherent or "natural" monopoly, but

from Honeywell's exclusive control over unique parts for its equipment. (C.A.App. 1059-1060). PSI offered direct evidence of this market power in the aftermarket in the form of supracompetitive prices, the exclusion of competition in the service market, and the forced consumption of services. (C.A.App. 1047-1048). Indeed, Honeywell's profit margin on one service plan in particular was 70%. (C.A.App. 1060). Moreover, PSI demonstrated that Honeywell's share of the service market was 97% even though 76% of Honeywell's customers wanted another service alternative. (C.A.App. 1059-1060).

Like the defendant in Kodak, Honeywell claimed that it could not possess market power in the aftermarket in a competitive original equipment market. PSI, however, proffered evidence that both switching and information costs prevent any competition in the equipment market from disciplining price in the parts and service markets. (C.A.App. 1062-1065). Indeed, one Honeywell witness characterized the cost of switching equipment alone as "phenomenal." (C.A.App. 1351-1352).

Despite this proffer of evidence supporting the existence of market power in the aftermarkets for Honeywell equipment, the Court of Appeals for the Sixth Circuit rejected the possibility of market power in the aftermarkets. PSI Repair Services, Inc. v. Honeywell, Inc., 104 F.3d 811, 820-821 (6th Cir. 1997). The Court

of Appeals held that, as a matter of law, competition in the equipment market vitiates market power in the aftermarkets even in the presence of market imperfections, as long as the manufacturer has maintained a consistent and stated parts restrictive policy. Id. Thus, the Court of Appeals for the Sixth Circuit limited the application of Kodak to manufacturers who change their policy after "locking-in" consumers.

In so holding, the Court of Appeals ignored the effect of switching costs and minimized the impact of high information costs. As a result, the Sixth Circuit improperly rejected the essential economic underpinnings of Kodak. Moreover, such a grant of antitrust immunity based on a factual distinction between Kodak and the instant case extends beyond the proper scope of judicial discretion. This Court in Kodak specifically rejected the adoption of such per se immunity in antitrust cases. Kodak, 504 U.S. at 479 n. 29.

The Court of Appeals for the Sixth Circuit cited support from other circuits for limiting the scope of this Court's decision in Kodak. The Court of Appeals pointed to decisions in the First and Seventh Circuits that restricted Kodak's reach to situations in which the seller's policy was not generally known. PSI Repair Services, 104 F.3d. at 819-820, citing Digital Equip. Corp. v. Uniq Digital Techs., Inc., 73 F.3d 756, 763 (7th Cir. 1996) and Lee v.

Life Ins. Co. of North America, 23 F.3d 14, 20 (1st Cir.), cert. denied, 115 S. Ct. 427 (1994). According to the Sixth Circuit, these other Circuits would apparently limit the application of Kodak to manufacturers who have changed their policies.

The decisions of these Circuits stand in direct conflict with decisions by the Third and Fifth Circuits in which the existence of market power in the aftermarkets did not turn on such a policy change. See United Farmers Agents v. Farmers Ins. Exchange, 89 F.3d 233 (5th Cir. 1996); see also Allen-Myland v. IBM, 33 F.3d 194 (3rd Cir. 1994). Indeed, the Court of Appeals for the Sixth Circuit previously ruled that market power could exist in the aftermarkets in the absence of any allegation that the manufacturer changed its parts policy. Virtual Maintenance, Inc. v. Prime Computer, Inc., 11 F.3d 660, 667 (6th Cir. 1993). This welter of confusion should not be permitted to exist.

This conflict is of substantial importance. The limitation placed by the Court of Appeals for the Sixth Circuit on Kodak would exempt many manufacturers from antitrust liability even if they used their control over unique parts to control price and injure competition in the service market. The economic and commercial ramifications of this ruling are significant.

Thus, the Petition should be granted. All of the traditional criteria for the exercise of this Court's certiorari jurisdiction are met.

B. Proceedings Below

On January 5, 1995, the district court granted summary judgment on PSI's claim of monopolization under Section 2 of the Sherman Act. (App. B). It held that Honeywell had an unqualified and absolute right to refuse to sell proprietary products to PSI. (App. B). On March 9, 1995, the district court entered its opinion and order granting summary judgment on PSI's claim of tying, holding that PSI failed to produce evidence of separate products. (App. C). Judgment was then entered for Honeywell on all claims. (App. D).

The Court of Appeals for the Sixth Circuit upheld the district court's judgment on very different grounds. On the claim of tying, the Court of Appeals concluded that the district court improperly relied on its incorrect perception of the lack of separate products as the basis for granting summary judgment on PSI's Section 1 claim. PSI Repair Services, 104 F.3d at 817. Instead, the Court of Appeals concluded that Honeywell lacked market power in the aftermarket. PSI Repair Services, 104 F.3d at 820. In so concluding, the Court of Appeals focused on a fact present

in Kodak but not present in this case: Kodak's change in policy. PSI Repair Services, 104 F.3d at 820. The Court of Appeals found this factual distinction to be crucial to the Supreme Court's decision in Kodak. Id. It believed that, but for this distinction, this Court would have defined the relevant market as the equipment market. PSI Repair Services, 104 F.3d at 820.

The Court of Appeals consequently fashioned a legal rule on this factual distinction, limiting a "Kodak-type theory" to lock-in caused by policy changes:

> ...we thus hold that an antitrust plaintiff cannot succeed on a Kodak-type theory when the defendant has not changed its policy after locking-in some of its customers, and the defendant has been otherwise forthcoming about its pricing structure and service policies. This rule should encourage manufacturers to divulge all relevant information at the time of sale.

PSI Repair Services, 104 F.3d at 820.

While the Court acknowledged the importance of market imperfections in Kodak, the Court of Appeals concluded that they alone were not worthy of antitrust condemnation. PSI Repair Services, 104 F.3d at 820. It indicated that accepting PSI's position would expose manufacturers of durable, expensive equipment to potential antitrust liability for having inherent power over the aftermarkets of their products. PSI Repair Services, 104 F.3d at 820. This result, according to the Court of

Appeals, was neither intended by the decision in Kodak nor consistent with Jefferson Parish Hosp. Dist. No. 2 v. Hyde, 466 U.S. 2 (1984). PSI Repair Services, 104 F.3d at 820. The Court of Appeals thus held that the relevant market was the primary equipment market, a market in which Honeywell had no market power. PSI Repair Services, 104 F.3d at 821.

In addressing the claim of monopolization made by PSI, the Court of Appeals indicated that its analysis was largely dictated by its own definition of the relevant market as the equipment market. PSI Repair Services, 104 F.3d at 821. Because PSI had not shown the existence of market power in the equipment market, it could not prevail on a claim of monopolization. PSI Repair Services, 104 F.3d at 821. The Court of Appeals also stated that even if a showing of market power in the equipment market had been made, PSI could not prevail because it failed to allege exclusionary or willful conduct in this market. PSI Repair Services, 104 F.3d at 822. The Court of Appeals accordingly affirmed the judgment of the district court.

REASONS FOR GRANTING THE WRIT

This case centers on whether a Court of Appeals may, as a matter of law, exempt an entire class of defendants from potential antitrust liability. In PSI Repair

Services, the Court of Appeals for the Sixth Circuit excluded from "Kodak-type" liability manufacturers who have not changed their stated restrictive policies. PSI Repair Services, 104 F.3d at 820. In so doing, the Court of Appeals sharply and incorrectly confined the Supreme Court's decision in Kodak. This Court's decision in Kodak, however, expressly warns against the adoption of such a sweeping rule of law. More important, the legal rule manufactured by the Court of Appeals for the Sixth Circuit runs directly contrary to the legal and economic principles enunciated in Kodak.

While the First and Seventh Circuits support the reasoning adopted by the Sixth Circuit in PSI Repair Services, the Third and Fifth Circuits directly conflict with this analysis of relevant markets and market power. Moreover, the Court of Appeals for the Sixth Circuit itself has previously held that antitrust liability can exist even in the absence of a change in policy. Virtual Maintenance, Inc. v. Prime Computer, Inc., 11 F.3d 660 (6th Cir. 1993), amending 995 F.2d 1324 (1993). This conflict among Circuits and within the Sixth Circuit itself strongly supports the need for this Court to address the question presented for review.

This matter has substantial commercial and economic significance. Manufacturers, consumers, and independent service organizations all have a stake in the

outcome of this case. If manufacturers benefit from the presumption established by the Court of Appeal, they will inevitably benefit at the expense of consumers and competition. Moreover, it would be inconsistent for the First, Sixth, and Seventh Circuits to exclude from antitrust liability a class of manufacturers that could be subject to such liability for the same conduct in the Third and Fifth Circuits. In the area of interstate commerce, uniformity of the law is a necessity. The decision below should be addressed for the benefit of all Circuits.

I. THE COURT OF APPEALS' DECISION CONFLICTS WITH THE SUPREME COURT'S DECISION IN KODAK

A. The Court of Appeals Decision Conflicts with the Holding on Market Power Set Forth in Kodak

Market power is broadly defined as the power to raise price and restrict output. Kodak, 504 U.S. at 464, citing Fortner Enterprises, Inc. v. United States Steel Corp. et. al., 394 U.S. 495, 503 (1969). It is equally understood as the power to force consumers to do what they would not do in a competitive market. Kodak, 504 U.S. at 464. Such power may derive from the uniqueness of a product or be inferred from a predominant share of the market. Kodak, 504 U.S. at 464 (predominant share of market); see

United States v. Loew's, Inc., 371 U.S. 38 (1962)(uniqueness of product); see also Jefferson Parish, 466 U.S. at 16-17 (uniqueness of product).

In Kodak, this Court held that market power could exist in the aftermarkets for a single brand of equipment. Kodak, 504 U.S. at 477-478. Indeed, this Court found market power evidenced by supracompetitive service prices, the exclusion of competition, and the forced unwilling consumption of service. Kodak, 504 U.S. at 465. As stated by this Court in Kodak,

> Under our prior precedents, this evidence would be sufficient to entitle [plaintiffs] to a trial on their claim of market power.

Kodak, 504 U.S. at 465.

This Court also expressly held that market power could exist even in the face of competitive forces in the equipment market, stating:

> The fact that the equipment market imposes a restraint on prices in the aftermarkets by no means disproves the existence of power in those markets....Thus, contrary to Kodak's assertion, there is no immutable physical law--no "basic economic reality"--insisting that competition in the equipment market cannot coexist with market power in the aftermarkets.

Kodak, 504 U.S. at 471. In particular, this Court recognized that market imperfections, such as information and switching costs, can prevent competition in the

equipment market from having any meaningful effect on market abuse in the aftermarkets for parts and service. Kodak, 504 U.S. at 473. As stated by this Court,

> These costs could create a less responsive connection between service and parts prices and equipment sales.

Kodak, 504 U.S. at 473. This decoupling of the equipment market from the aftermarkets would allow a manufacturer to charge supracompetitive prices in the aftermarket without concern for competition in the equipment market.

PSI marshalled its evidence in light of the very economic principles set forth in Kodak. Like the plaintiffs in Kodak, PSI demonstrated direct evidence of market power in the form of supracompetitive prices, the exclusion of competition, and the forced unwilling consumption of Honeywell's services. (C.A.App. 1047-1048). PSI also demonstrated that switching and information costs decoupled competition in the equipment market from market power in the aftermarket. (C.A.App. 1062-1065).

Rather than give proper effect to Kodak, the Court of Appeals for the Sixth Circuit restricted the scope of this Court's decision to a narrower class of cases than Kodak itself envisions. The Court of Appeals wrongly limited Kodak to cases in which the manufacturer changes its policy, stating:

> We thus hold that an antitrust plaintiff cannot succeed on a Kodak-type theory when the defendant

> has not changed its policy after locking-in some of its customers, and the defendant has been otherwise forthcoming about its pricing structure and service policies.

PSI Repair Services, 104 F.3d at 820.

The rationale for turning this factual distinction between Kodak and PSI Repair Services into a legal rule stems from a clear misreading of Kodak. The Court of Appeals read into this Court's decision that a change in policy was a necessary element to tying and monopolization under a "Kodak-type theory:"

> We likewise agree that the change in policy in Kodak was the crucial factor in the Court's decision. By changing its policy after its customers were "locked in," Kodak took advantage of the fact that its customers lacked the information to anticipate this change. Therefore, it was Kodak's own actions that increased its customers' information costs. In our view, this was the evil condemned by the Court and the reason for the Court's extensive discussion of information costs.

PSI Repair Services, 104 F.3d at 820. In reaching this conclusion, the Court of Appeals misread Kodak in two critical ways. First, the evil condemned in Kodak consisted of higher service prices and market foreclosure. Kodak, 504 U.S. at 478. Both of which PSI demonstrated. Secondly, and more important, the Court of Appeals wrongly minimized the significance of information costs

and entirely ignored the "lock-in" effect of high switching costs.

While the Court of Appeals acknowledged the existence of information costs - the cost of calculating the price of equipment over its lifetime and of conducting lifecycle pricing, it nevertheless ignored their economic and legal significance. PSI Repair Services, 104 F.3d at 818. The Sixth Circuit peremptorily found these information costs to be always present in an economy with imperfect information, and thus not worthy of antitrust consideration. PSI Repair Services, 104 F.3d at 820. The Court of Appeals then indicated that any such costs were mitigated by Honeywell's publication of its parts policy and related information. PSI Repair Services, 104 F.3d. at 820-821. In sum, according to the Sixth Circuit, because Honeywell did not "surprise" consumers with its policy, it could not have market power in the aftermarket.

Such a proposition has no foundation in Kodak. Critically, this Court did not limit the economic principles set forth in Kodak to instances in which consumers were surprised by the manufacturer's change in policy. Surprise is but one of the ways in which manufacturers can reap monopoly profits in aftermarket cases. Shapiro, Aftermarkets and Consumer Welfare: Making Sense of Kodak, 63 Antitrust Law Journal 483, 487-488 (1995) (App. G, 113-115). Indeed, this Court's concern with

information costs stems from the difficulty of assessing the total cost of the equipment, services and parts over the machine's lifetime at the point of sale. Kodak, 504 U.S. at 475-476. These difficulties are no less present when the manufacturer's parts-restrictive policy is known up front. Consumers would still have practical problems determining the cost of the policy over the machine's lifetime in the first instance.

Moreover, the existence of high switching costs alone can economically decouple the equipment market from the aftermarket. See MacKie-Mason, Antitrust Policy in Aftermarkets, 63 Antitrust Law Journal 455, 460-461 (1995) (App. F, 60-63). As recognized by this Court,

> If the cost of switching is high, consumers who already have purchased the equipment, and are thus "locked-in," will tolerate some level of service-price increases before changing equipment brands. Under this scenario, a seller profitably could maintain supracompetitive prices in the aftermarket if the switching costs were high relative to the increase in service prices, and the number of locked-in customers were high relative to the number of new purchasers.

Kodak, 504 U.S. at 476. Thus, even in the complete absence of information costs, high switching costs would allow a manufacturer to maintain market power in the aftermarkets for its equipment.

In essence, this case involves the adoption of the same flawed approach to determining relevant markets and assessing market power in tying and monopolization cases rejected by the Supreme Court in Kodak. Although the Court of Appeals for the Sixth Circuit ostensibly based its opinion on Kodak, its reading misapprehends the significance of both switching and information costs that insulate aftermarkets from the effects of vigorous competition in the primary market. By ignoring the effect of market imperfections, the Court of Appeals improperly rejected the holding of Kodak.

B. The Court of Appeals' Decision Conflicts with the Proscription against Legal Presumptions in Kodak

The Court of Appeals further disregarded Kodak by holding that manufacturers can, as a matter of law, escape liability from tying and monopolization claims if they have always maintained their stated parts restrictive policy:

> In light of our reading of Jefferson Parish and Kodak, we thus hold that an antitrust plaintiff cannot succeed on a Kodak-type theory when the defendant has not changed its policy after locking-in some of its customers, and the defendant has been otherwise forthcoming about its pricing structure and service policies.

PSI Repair Services, 104 F.3d. at 820 (emphasis added). In adopting this rule, the Court of Appeals essentially

granted manufacturers immunity from antitrust liability in the aftermarket for their equipment if they have not changed their stated policy. In Kodak, however, this Court warned explicitly against this precise transformation of economic theory into judge-made law.

> The dissent urges a radical departure in this Court's antitrust law. It argues that because Kodak has only an "inherent" monopoly in parts for its equipment, post, at 489-490, the antitrust laws do not apply to its efforts to expand that power into other markets. The dissent's proposal to grant per se immunity to manufacturers competing in the service market would exempt a vast and growing sector of the economy from the antitrust laws. Leaving aside the question whether the Court has the authority to make such a policy decision, there is no support for it in our jurisprudence or the evidence in this case.

Kodak, 504 U.S. at 479 n. 29. The rule adopted by the Sixth Circuit in PSI Repair Services is fatally inconsistent with this proscription against the per se immunity.

The Court of Appeals' unwillingness to follow Kodak apparently stems from the fear of subjecting manufacturers with "inherent" market power over their aftermarkets to litigation:

> Accepting PSI's argument would expose many manufacturers of durable, expensive equipment to potential antitrust liability for having inherent power over the aftermarkets of their products, a result

> certainly not intended by Kodak and not consistent with Jefferson Parish.

PSI Repair Services, 104 F.3d at 820. It is important to note, however, that this fear is identical to that echoed by the dissent in Kodak. Kodak, 504 U.S. at 489 (Scalia, J. dissenting). Indeed, the majority in Kodak expressly rejected the conclusion that manufacturers should have some immunity to the antitrust laws.

> Even assuming, despite the absence of any proof from the dissent, that all manufacturers possess some inherent market power in the parts market, it is not clear why that should immunize them from the antitrust laws in another market.

Kodak, 504 U.S. at 479 n. 29.

In this case, the support for adopting immunity rests on an even slimmer reed where market power stems from horizontal agreements with parts manufacturers and not from any patent or copyright. Indeed, even if Honeywell could somehow justify its maintenance of a parts monopoly over its brand of components, this justification could not insulate Honeywell from liability for misusing this power in the separate market for service. As this Court stated in Kodak,

> The Court has held many times that power gained through some natural and legal advantage such as patent, copyright, or business acumen can give rise to liability if "a seller exploits his dominant position in one market to expand his empire into the next."

Kodak, 504 U.S. at 479 n. 29, quoting Times-Picayune Publishing Co. v. United States, 345 U.S. 594, 611 (1953). Thus, the Sixth Circuit's support for adopting per se immunity for manufacturers with "inherent" power in the aftermarkets simply contradicts Kodak.

II. THE COURT OF APPEALS' DECISION CONFLICTS WITH THE DECISIONS OF OTHER CIRCUITS

The decision by the Court of Appeals for the Sixth Circuit accentuates the conflict among circuits concerning the existence of market power in the absence of a change in policy. Prior to PSI Repair Services, both the First and Seventh Circuits implied that the change in policy in Kodak created the actionable lock-in that allowed Kodak to reap monopoly profits. See Digital Equip. v. Uniq Digital Technologies, 73 F.3d 756 (7th Cir. 1996); see Lee v. Life Ins. Co. of North America, 23 F.3d 14, 20 (1st Cir. 1994). The Court of Appeals for the Sixth Circuit has simply extrapolated this "change in policy" distinction reflected in Digital and Lee to a necessary element in a claim of tying and monopolization in the aftermarkets.

In sharp contrast, the Third and Fifth Circuits have declined to require a change in policy to demonstrate lock-in. See United Farmers Agents v. Farmers Ins. Exchange,

89 F.3d 223 (5th Cir. 1996); see also Allen-Myland v. IBM, 33 F.3d 194 (3rd Cir. 1994). In both of these cases, as in Kodak, the Courts of Appeals noted that high switching costs alone could prevent competition in the equipment market from disciplining price in the aftermarket. United Farmers Agents, 89 F.3d. at 239 ("Farmers could exercise market power and sell electronic access or computers at above-market prices only to those agents with high switching costs."); see also Allen-Myland, 33 F.3d at 208 ("in Kodak, as we have already discussed, the Supreme Court held that users are locked into a particular vendor by the sunk cost of the product, market power may exist in the aftermarket for parts even though the equipment market is competitive."). Thus, even if consumers were not surprised by a change in policy, a manufacturer could continue to reap supracompetitve profits by taking advantage of already locked-in customers at the expense of future sales of equipment or by discriminating in price between new customers and locked-in customers. Kodak, 504 U.S. at 476-477. Indeed, if new sales were small, the manufacturer would have every incentive to charge above-market prices in the parts and service aftermarkets to make up for lost revenue in the equipment market. See MacKie-Mason, Antitrust Policy in Aftermarkets, 63 Antitrust Law Journal at 460-463 (App F, 60-67).

In PSI Repair Services, the Court of Appeals for the Sixth Circuit has drawn a line that is at once bright and misplaced: market power cannot exist in aftermarkets in the absence of a change in policy. The further development of case law by other Circuits will not cure this stark controversy. Circuits will either support PSI Repair Services's rule or reject it.

The split among Circuits is particularly troubling in light of the interstate nature of the controversy. Like Honeywell, most manufacturers of expensive durable goods conduct their business on a national level. Hence, the same manufacturers of expensive durable equipment may have per se immunity from suit in the First, Sixth, and Seventh Circuits while being exposed themselves to liability in the Third and Fifth Circuits. Uniformity in the antitrust laws is not only desirable but necessary.

III. THE COURT OF APPEALS' DECISION CONFLICTS WITH THE SIXTH CIRCUIT'S OWN PRIOR OPINION

The Supreme Court last reviewed an antitrust aftermarket case from the Court of Appeals for the Sixth Circuit in Virtual Maintenance, Inc. v. Prime Computer, Inc., 957 F.2d 1318, cert. granted 113 S.Ct. 314 (1992)("Virtual I"). In Virtual I, as in Kodak, the plaintiff alleged tying of a unique product to service. The Court of

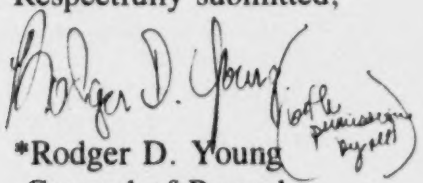
Appeals granted judgment notwithstanding the verdict, claiming the relevant market was equipment not the aftermarket. In granting certiorari, this Court vacated the Court of Appeals' decision upholding judgment not withstanding the verdict and remanded the case for further consideration in light of this Court's decision in Kodak. Virtual Maintenance, Inc. v. Prime Computer, Inc., 113 S.Ct. 314 (1992).

Upon remand, the Sixth Circuit held that switching costs alone could "lock-in" customers to their hardware preventing competition in the equipment market from affecting market power in the aftermarkets. Virtual Maintenance, Inc. v. Prime Computer, Inc., 11 F.3d 660, 667 (6th Cir. 1993)("Virtual II"), amending 995 F.2d 1324 (1993). Absent from Virtual II and absent from this case, was the allegation that the defendant changed its parts policy. In reconsidering the grant of judgment notwithstanding the verdict, the Sixth Circuit held that switching costs alone could demonstrate "lock-in." Virtual II, 11 F.3d at 667. At no point did the Court of Appeals for the Sixth Circuit in Virtual II carve out a requirement from Kodak that "lock-in" be demonstrated from a change in policy as in PSI Repair Services. By now requiring such a change in policy to establish lock-in, the Sixth Circuit has created a conflict with its own decision in Virtual II. Again, this conflict should be resolved by this Court.

CONCLUSION

The petition for a writ of certiorari should be granted, the judgment below should be vacated, and this case should be remanded for further consideration in light of Kodak. In the alternative, the petition for a writ of certiorari should be granted, and the case set for full briefing and argument.

Respectfully submitted,



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APPENDIX A

UNITED STATES COURT OF APPEALS
FOR THE SIXTH CIRCUIT

OPINION

Sixth Circuit Case No. 95-1351
Filed January 13, 1997

RECOMMENDED FOR FULL-TEXT PUBLICATION
Pursuant to Sixth Circuit Rule 24

ELECTRONIC CITATION: 1997 FED App. 0008P (6th Cir.)
File Name: 97a0008p.06

No. 95-1351

UNITED STATES COURT OF APPEALS
FOR THE SIXTH CIRCUIT

PSI Repair Services, Inc., *Plaintiff-Appellant,*	]	
	|	On Appeal from the United States District Court for the Eastern District of Michigan
v.	>	
Honeywell, Inc., *Defendant-Appellee.*	|	
	]	

Decided and Filed January 13, 1997

Before: BOGGS and MOORE, Circuit Judges; HILLMAN, District Judge.*

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*The Honorable Douglas Hillman, United States District Judge for the Western District of Michigan, sitting by designation.

KAREN NELSON MOORE, Circuit Judge. This case presents several issues involving §§ 1 and 2 of the Sherman Antitrust Act.** Plaintiff PSI Repair Services, Inc. ("PSI") asserted an illegal tying claim under § 1 and a monopolization claim under § 2 against defendant Honeywell, Inc. ("Honeywell"). The district court granted summary judgment in favor of Honeywell on both counts. For the reasons that follow, we affirm, on different grounds, the judgment of the district court.

I. BACKGROUND

Honeywell manufactures and sells industrial control equipment. This equipment controls the manufacturing processes at various refineries and factories. At issue in this case are three different types of control equipment: the TDC, or "Total Distributed Controller"; the PLC, or "Programmable Logic Controller"; and the UDC, or

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**Section 1 of the Sherman Act provides in relevant part: "Every contract, combination in the form of trust or otherwise, or conspiracy, in restraint of trade or commerce among the several States, or with foreign nations, is declared to be illegal." 15 U.S.C. § 1. Section 2 provides: "Every person who shall monopolize, or attempt to monopolize, or combine or conspire with any other person or persons, to monopolize any part of the trade or commerce among the several States, or with foreign nations, shall be deemed guilty of a felony, and, on conviction thereof, shall be punished by fine not exceeding $10,000,000 if a corporation, or, if any other person, $350,000, or by imprisonment not exceeding three years, or by both said punishments, in the discretion of the court." 15 U.S.C. § 2.

"Universal Digital Controller." The TDC, which ranges in price up to $800,000 per unit, automates and controls the manufacturing processes at industrial facilities, such as oil refineries, paper mills, and chemical processing plants. The PLC controls various robotic operations on automobile assembly lines. While less sophisticated than a TDC, the PLC and TDC share some common characteristics. The third controller at issue, the UDC, which ranges in price from $250 to in excess of $4,000, regulates temperature operations in various industrial settings. J.A. at 371.

Honeywell's industrial control equipment contains and depends heavily on printed circuit boards. These boards, which range in price from $200 to $5000, are comprised of a thin rectangle of fiberglass that is laminated with copper foil. Placed on this fiberglass are numerous components, such as computer chips, that communicate with each other via the copper foil on the board. These components periodically fail, which in turn often causes the circuit board and the industrial control equipment also to fail. J.A. at 38-39. When a circuit board fails, Honeywell will replace it with a new or refurbished board, charging its customer fifty percent of the list price, so long as the customer returns the defective board. J.A. at 306. Upon receipt of the defective board, Honeywell evaluates it to determine whether it is repairable. If it is, Honeywell will replace any defective component and then test the board before placing the board back into its

inventory. Thus, the customer does not receive the same board that it returned. Honeywell does not distinguish between its new and refurbished boards within its parts inventory. J.A. at 295.

Roughly ninety-five percent of the components on the circuit boards, referred to as "generic components," can be purchased either from the component manufacturer or from a component distributor. The other five percent are designed specifically for Honeywell by third-party manufacturers, as Honeywell itself does not manufacture components. Honeywell has restrictive agreements with these manufacturers whereby the manufacturers agree not to sell these components to either Honeywell equipment owners or service organizations such as PSI. Honeywell also has a stated policy of not selling its components to anyone. J.A. at 295. When a circuit board fails, equipment owners cannot usually identify which component caused the failure. J.A. at 1059. Thus, as a result of Honeywell's restrictive policy, its equipment owners essentially must return to Honeywell to obtain an entire replacement board.

PSI offers circuit-board repair services to owners of industrial control equipment. It does not manufacture industrial control equipment, and, similar to Honeywell, it does not manufacture board components. PSI provides board services for customers who own systems manufactured by

Honeywell's competitors by purchasing the necessary components from either the equipment or component manufacturer. J.A. at 356-60. It is also able to obtain any firmware and documentation necessary for the non-generic components either from the manufacturer's marketing information or by purchasing this information from the manufacturer. J.A. at 359-60.

Because PSI is unable to obtain any of the components manufactured exclusively for Honeywell, it is, for all practical purposes, unable to compete in the market for repair of Honeywell boards. Indeed, the district court took judicial notice of this fact. J.A. at 396-97. The record contains ample evidence that without this restriction, PSI could effectively compete in the market for Honeywell board repair work. PSI's economic expert expressed the opinion that in an unrestrained market, PSI's market share should be as high as twenty-seven percent. J.A. at 1005. In addition, PSI's chief operating officer, Eugene Laurie, testified at the district court's evidentiary hearing about the numerous Honeywell equipment owners that have asked PSI to perform board repairs, only to find out that, because of Honeywell's restrictive policy, PSI may not be able to repair their board. J.A. at 373-76. While the district court apparently did not reject these contentions, it did not find them determinative in its analysis.

The district court granted Honeywell's motion for summary judgment on the § 1 tying claim because it found that there were not two separate products that could be tied. It stated in its order addressing the § 1 claim that "there are not separate markets for parts for the circuit boards manufactured by defendant and for the servicing of circuit boards when a board requires repair or replacement." District Ct. Order Dismissing § 1 Claim at 2-3. In granting Honeywell's motion for summary judgment on the § 2 claim, the court declared: "Here the only thing defendant has done is maintain its right to proprietary technology by declining to make available to the market the proprietary components that make up part of its circuit boards. Under such circumstances there is no genuine issue of material facts which is ripe for jury determination." District Ct. Order Dismissing § 2 claim at 3. As we explain at length below, the § 1 ruling was incorrect. But as we also explain, the primary equipment market, not any aftermarket, is the relevant market in this case for purposes of §§ 1 and 2. Because of this conclusion, the district court's § 2 analysis is no longer applicable in this case. Our relevant market analysis, however, leads us to conclude that summary judgment nonetheless was proper on both claims.

II. STANDARD OF REVIEW

We review a district court's grant of summary judgment de novo. *See City of Mount Clemens v. EPA*, 917 F.2d 908, 914 (6th Cir. 1990); *Pinney Dock & Transp. Co.*

v. Penn Cent. Corp., 838 F.2d 1445, 1472 (6th Cir.), *cert. denied*, 488 U.S. 880 (1988). Summary judgment is appropriate when "the pleadings, depositions, answers to interrogatories, and admissions on file, together with the affidavits, if any, show that there is no genuine issue as to any material fact and that the moving party is entitled to a judgment as a matter of law." Fed. R. Civ. P. 56(c). In determining whether the non-moving party has raised a genuine issue of material fact, "[t]he evidence of [appellant] is to be believed, and all justifiable inferences are to be drawn in [its] favor." *Eastman Kodak Co. v. Image Technical Servs., Inc.*, 504 U.S. 451, 456 (1992) (citations omitted). Prior to *Kodak*, there had been some debate whether *Matsushita Elec. Indus. Co. v. Zenith Radio Corp.*, 475 U.S. 574 (1986), placed special burdens on antitrust plaintiffs responding to summary judgment challenges. But this debate was resolved in *Kodak*, when the Court stated: "*Matsushita* demands only that the nonmoving party's inferences be reasonable in order to reach the jury, a requirement that was not invented, but merely articulated, in that decision." 504 U.S. at 468. We therefore now turn to the evidence in the record, construing it in a light most favorable to PSI, in order to determine whether it raises a genuine issue of material fact and whether PSI's inferences from this evidence are reasonable.

III. THE TYING CLAIM

Appellant alleges that Honeywell has violated § 1 of the Sherman Act through an impermissible tying arrangement. In particular, PSI contends that Honeywell has illegally tied the sale of its circuit-board components to its circuit-board repair services. "A tying arrangement is 'an agreement by a party to sell one product but only on the condition that the buyer also purchases a different (or tied) product, or at least agrees that he will not purchase that product from any other supplier.'" *Kodak*, 504 U.S. at 461 (quoting *Northern Pac. Ry. Co. v. United States*, 356 U.S. 1, 5-6 (1958)). Such an arrangement constitutes an impermissible tie under § 1 of the Sherman Act "if the seller has 'appreciable economic power' in the tying product market and if the arrangement affects a substantial volume of commerce in the tied market." *Id.* at 462.[3] While a

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[3]While PSI argues on appeal that Honeywell's tying arrangement is illegal under both per se and rule-of-reason analysis, these two theories have, in effect, merged in recent years. Under traditional per se analysis, restraints of trade were condemned without any inquiry into the market power possessed by the defendant. *See, e.g., Northern Pacific Ry. Co. v. United States*, 356 U.S. 1, 5 (1958). However, under tying's per se rule, the seller must possess substantial market power in the tying product market. In addition, tying's per se rule provides for an inquiry into whether the defendant's conduct has procompetitive effects. *See Kodak*, 504 U.S. at 478-79. Such an extensive factual inquiry is hardly the stuff of per se analysis. Under rule-of-reason analysis, the antitrust plaintiff must show, inter alia, an adverse effect on competition.

substantial amount of commerce is potentially involved, Honeywell disputes both the existence of two separate products and market power.

A. Separate Products

For the district court's grant of summary judgment to be reversed, PSI must first show that a reasonable trier of fact could find that circuit-board components and service are two distinct products. Our analysis of this issue is controlled largely by the Supreme Court's decisions in *Eastman Kodak Co. v. Image Technical Servs., Inc.*, 504 U.S. 451 (1992), and *Jefferson Parish Hosp. Dist. No. 2 v. Hyde*, 466 U.S. 2

See Jefferson Parish Hosp. Dist. No. 2 v. Hyde, 466 U.S. 2, 29-30 (1984). This circuit adopted the following three-step analysis for determining whether a tying arrangement is likely to cause such an anticompetitive effect: "(1) the seller must have power in the tying product market; (2) there must be a substantial threat that the tying seller will acquire market power in the tied-product market; and (3) there must be a coherent economic basis for treating the tying and tied products as distinct." *Hand v. Central Transp., Inc.*, 779 F.2d 8, 11 (6th Cir. 1985). Thus, in this circuit, market power in the tying product market is an indispensable requirement under either per se or rule-of-reason analysis. As Professors Areeda, Elhauge, and Hovenkamp comment, "the per se rule against tying is 'per se' in only one respect--namely, dispensing with proof of anticompetitive effects . . . ." 10 PHILLIP E. AREEDA ET AL., ANTITRUST LAW ¶ 1760e, at 372 (1996). The merger of these two theories is apparent in the majority opinion in *Kodak*, which does not even mention the terms "per se" or "rule of reason," even though *Kodak* was technically a per se case.

(1984). In *Kodak*, the plaintiffs, a group of independent service organizations (ISOs), contended that Kodak had illegally tied the sale of replacement parts for its photocopiers and micrographic equipment to the service of such equipment. Because of Kodak's unique parts and its restrictive policy, the ISOs could not perform the repairs on Kodak machines. Kodak contended that parts and service could not constitute separate products under § 1 of the Sherman Act. In rejecting this contention, the Court remarked that parts and service could be separate products if there is "sufficient consumer demand so that it is efficient for a firm to provide service separately from parts." 504 U.S. at 462.

The consumer-demand test articulated in *Kodak* merely clarified what had already been decided in *Jefferson Parish*. In *Jefferson Parish*, the plaintiff, an anesthesiologist, alleged that the defendant hospital's exclusive contract with a firm of anesthesiologists was an illegal tie under § 1. The hospital responded that it was "merely providing a functionally integrated package of services." 466 U.S. at 19. Rejecting the hospital's argument, the Court stated that, in determining whether one or two products is involved, the focus should be "not on the functional relation between them, but rather on the character of the demand for the two items." *Id.* Indeed, as the *Kodak* Court stated, "We have often found arrangements involving functionally linked products at least one of which

is useless without the other to be prohibited tying devices." 504 U.S. at 463 (quoting *Jefferson Parish*, 466 U.S. at 19 n.30). With *Jefferson Parish* and *Kodak* as our guide, we now turn to the facts of this case.

Honeywell first contends that it does not even sell repair services, the tied product in this case. It claims that instead of servicing a defective circuit board, it simply replaces the board with a new or refurbished one, charging the same price for all similar replacement boards, regardless of the problem with the defective board. Honeywell, however, cannot claim that it does not participate in the repair business simply because the replacement board it gives a customer is not the same one the customer returned. Honeywell has decided that it is more cost-effective to replace a board immediately and then later to determine whether the board is worth repairing than to attempt to repair the same board returned by its customer. But this decision does not alter the fact that Honeywell repairs a substantial number of the boards that are returned. Simply put, there is substantial evidence that Honeywell repairs circuit boards.

Honeywell next contends that even if its practices reasonably can be characterized as involving repair services, separate markets for components and board services do not exist because consumers simply demand functioning replacement boards. We agree with Honeywell that its

customers want functioning boards. In *Kodak*, the consumers certainly wanted functioning photocopiers, just as all consumers want functioning products. Yet this elementary conclusion had no bearing on the *Kodak* Court's inquiry into whether parts and services could be distinct products for antitrust purposes in that case. Similarly, Honeywell's characterization of its customers' needs moves us no closer to the resolution of the separate-products issue in this dispute.

What does aid our analysis in this case is the evidence in the record suggesting that it would be efficient for a firm to provide some component parts separate from circuit-board repair services. PSI's very existence indicates the possibility of a separate market for service, because PSI does not manufacture any of the component parts for the circuit boards but instead purchases them from third-party manufacturers. *See Kodak*, 504 U.S. at 462 ("[T]he development of the entire high-technology service industry is evidence of the efficiency of a separate market for service."). There is also evidence in the record that it is not uncommon for other control-equipment manufacturers to sell circuit-board components. J.A. at 1201. Moreover, the record contains evidence that some circuit-board repair services do not even involve the purchase of components. J.A. at 1203-04. In addition, Honeywell admits that the generic components on its circuit boards--roughly 95% of the components--are

available for sale either directly through the manufacturer or a third-party distributor. J.A. at 224.

Indeed, Honeywell itself sells components for its PLC equipment to customers and admits allowing one customer to purchase TDC components from it. In describing the latter situation, Edward Hurd, Honeywell's President of Industrial Control indicated that a "concession" was made in its policy to one customer. J.A. at 295-96. From the record before us, it appears that other Honeywell customers would welcome a similar concession. PSI's industry expert indicated that without Honeywell's component-part restrictions, PSI's repair market for Honeywell equipment would be twenty-seven percent. J.A. at 1005. The same expert also conducted a survey indicating that fifteen percent of Honeywell customers have purchased and continue to purchase component parts from Honeywell without purchasing circuit-board repair services. J.A. at 1003. While Honeywell contends that only one customer continues to purchase its component parts, this contention, when compared to the PSI survey, creates an issue of material fact that we are not in a position to resolve at the summary judgment stage.

More important, however, Honeywell's own actions have essentially limited the existence of a separate market for components. On this point, *Allen-Myland, Inc. v. IBM*, 33 F.3d 194 (3rd Cir.), *cert. denied*, 115 S. Ct. 684 (1994), is

instructive. At issue in *Allen-Myland* was a "net pricing policy" by the defendant, which essentially required IBM customers to purchase computer upgrades and upgrade installation together. On a few occasions, however, IBM allowed customers to purchase the upgrade parts separately. IBM then contended that because only a few upgrades were sold apart from service, no separate market existed for service. In rejecting this argument, the Third Circuit stated that "the fact a few . . . upgrades were sold [separately from the installation] does not prove that there was no separate demand for installation services, particularly considering that IBM had every economic incentive to protect its revenues and avoid widely publicizing the existence of such upgrades." *Id.* at 214. Similarly, Honeywell cannot point to its one customer that purchases components separately as evidence of a lack of a market for components, when it was Honeywell's own restrictive policy that assured the absence of a component market.

As a final argument, Honeywell asserts that a decision in favor of PSI here would expand § 1 to include virtually all parts of finished products, since very few products do not contain sub-parts of some kind. Honeywell's concerns are not without merit. *See Jefferson Parish*, 466 U.S. at 39 (O'Connor, J., concurring) ("All but the simplest products can be broken down into two or more components that are 'tied together' in the final sale."). While we are mindful of

the various efficiency gains that can accrue to both suppliers and customers from bundling certain products together, *see* 9 PHILLIP E. AREEDA, ANTITRUST LAW ¶ 1717b, at 214-18 (1991), we are confident that the antitrust laws provide the tools to distinguish between meritorious and non-meritorious claims. As a threshold matter, an antitrust plaintiff must be able to show that competition--as opposed to competitors--is harmed by the bundling of products. *See, e.g., HyPoint Tech., Inc. v. Hewlett-Packard Co.*, 949 F.2d 874, 878 (6th Cir. 1991), *cert. denied*, 503 U.S. 938 (1992) ("The antitrust laws were enacted for 'the protection of *competition*, not *competitors*.'") (quoting *Brown Shoe Co. v. United States*, 370 U.S. 294, 320 (1962) (emphasis in original)). Moreover, the Sherman Act is not triggered merely by the presence of component parts, but only when there is sufficient demand for these parts such that it would be efficient for a firm to provide them separately. *See Kodak*, 504 U.S. at 462. As the above discussion indicates, a question of fact exists in this case on this very point. We conclude, therefore, that the district court improperly relied on the lack of separate products as a basis for granting summary judgment in favor of Honeywell on PSI's § 1 claim.

B. Market Power

We must now consider the next feature of an illegal tying arrangement: appreciable economic power in the tying market. The district court did not address this issue, having

based its § 1 ruling on its finding that there were not separate products. Nonetheless, Honeywell contends that because it lacks market power, this is an alternative basis for granting summary judgment in its favor.

"Market power is the power 'to force a purchaser to do something that he would not do in a competitive market.' It has been defined as 'the ability of a single seller to raise price and restrict output.' The existence of such power ordinarily is inferred from the seller's possession of a predominant share of the market." *Kodak*, 504 U.S. at 464 (citations omitted). "Accordingly, the proper focus of concern is whether the seller has the power to raise prices, or impose other burdensome terms such as a tie-in, with respect to any appreciable number of buyers within the market." *Fortner Enterprises, Inc. v. United States Steel Corp.*, 394 U.S. 495, 504 (1969). If the seller has sufficient market power in the tying market to "force" the customer to purchase the tied product then "competition on the merits in the market for the tied item is restrained and the Sherman Act is violated." *Jefferson Parish*, 466 U.S. at 12. The market power requirement is important because, without market power, a seller cannot engage in the forcing necessary to establish a § 1 violation. A thirty-percent share of the market, standing alone, provides an insufficient basis from which to infer market power. *Id.* at 26-29. With this

background in mind, we turn to the parties' asserted definitions of the relevant market in this case.

PSI contends that Honeywell-brand components comprise the relevant market, since these components are not interchangeable with any other components offered in the market. It alleges that Honeywell has enough market power in the component market to force the undesired purchase of Honeywell board services. Honeywell, on the other hand, argues that the relevant market consists of either the market for all components used on its boards or the primary equipment market. Honeywell first claims that PSI is bound by a relevant market including all board-level components because this is how PSI has defined the relevant market until this appeal. While neither party has been exceptionally clear in its proposed definition of the relevant market, both PSI's amended complaint and its appellate brief indicate that it considers the relevant market to consist of only the Honeywell-brand circuit-board components. *See* First Am. Compl. ¶ 15; Appellant's Br. at 38.[4]

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[4]Honeywell's reasons for attempting to constrain PSI to a relevant market consisting of all components on Honeywell boards are obvious, since ninety-five percent of the components on its boards are widely available in the market. Nevertheless, it is questionable whether such a market definition would benefit Honeywell. Even though market power is normally established by controlling a substantial share of the market, market power also exists "when the seller offers a unique

Honeywell's real argument is that the relevant market should be defined to include all of the manufacturers of industrial control equipment with whom it competes. It contends that even if it possesses market power in the component market, competition in the primary equipment market precludes it from exercising this monopoly power. This was the precise argument presented by the defendant to the Court in *Kodak*. Defendant Kodak asked the Supreme Court to adopt a legal rule that "equipment competition precludes any finding of monopoly power in derivative aftermarkets." *Kodak*, 504 U.S. at 466.[5] In arguing against such a rule, the ISOs contended that information costs and switching costs prevented the competition in the primary market from constraining Kodak's ability to exact supracompetitive prices in the aftermarket. Information costs are costs that prevent consumers from obtaining all relevant information about a product at the time of sale. Switching costs are borne by customers who have already purchased a product and who would then incur some cost in switching to

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product that competitors are not able to offer." See *Jefferson Parish*, 466 U.S. at 17. In this case, Honeywell itself describes its own board components as "proprietary," and there is substantial evidence that competitors are unable to offer these components.

[5]In Kodak the Court found that the ISOs had conceded that Kodak lacked market power in the equipment market. *Kodak*, 504 U.S. at 465 n.10.

another product. Information and switching costs were particularly high in *Kodak* because Kodak adopted its parts-restrictive policy after numerous customers had already purchased Kodak copiers, thus creating a "lock-in" effect. Agreeing with the ISOs' theory that many Kodak customers were potentially "locked-in," the Court concluded that there was "a question of fact whether information costs and switching costs foil the simple assumption that the equipment and service markets act as pure complements to one another." *Id.* at 477.

Honeywell first contends that the Court in *Kodak* refused to uphold the grant of summary judgment largely because of the limited evidentiary record in *Kodak*. In *Kodak*, summary judgment was granted after a brief discovery period and without a hearing. *Id.* at 459. While Honeywell correctly concludes that the Court did not hold that summary judgment was never appropriate in aftermarket cases, neither did the Court hold that a more complete record would assure Kodak of summary judgment. Regardless of the size of the record after discovery, if a material issue of fact exists, summary judgment is inappropriate.

Honeywell's next attempt to distinguish *Kodak* has much more merit. It contends that while Kodak changed its service and parts policy to include the tie after many Kodak customers purchased their equipment, Honeywell has

consistently maintained its policy of board replacement. While Honeywell does not clearly articulate why this distinction is important, we interpret Honeywell's argument to be that the *Kodak* Court's finding of a material issue of fact on the definition of the relevant market resulted from Kodak's change in policy. PSI, on the other hand, argues that even without a change in policy, significant information costs still exist. It points to deposition testimony by Honeywell's own personnel that it would be "very difficult" for customers to determine the lifecycle cost of its equipment. J.A. at 1347. There is also evidence in the record that it would be difficult for Honeywell to predict the cost of parts down the road. J.A. at 1344. And while Honeywell equipment owners may know that Honeywell's equipment is often capable of lasting for the lifetime of the plant, the owners are constantly upgrading and enhancing the equipment along the way, so that these costs are difficult to gauge. J.A. at 1354-55.

The Court in *Kodak* did not explicitly state the extent to which Kodak's change in policy affected the Court's analysis. Nonetheless, it suggested that the outcome might have been different had Kodak presented evidence that its restrictive parts policy was consistently maintained and generally known. In responding to Justice Scalia's dissent, which argued, inter alia, that but for Kodak's change in policy, the Court would be faced with a traditional tie

between copiers and aftermarket service, the majority responded:

> The dissent disagrees [with our conclusion in this case] based on its hypothetical case of a tie between equipment and service. "The only thing lacking" to bring this case within the hypothetical case, states the dissent, "is concrete evidence that the restrictive parts policy was . . . generally known." But the dissent's "only thing lacking" is the crucial thing lacking--evidence. Whether a tie between parts and service should be treated identically to a tie between equipment and service, as the dissent and Kodak argue, depends on whether the equipment market prevents the exertion of market power in the parts market. Far from being "anomalous," requiring Kodak to provide evidence on this factual question is completely consistent with our prior precedent.

504 U.S. at 477 n.24 (internal citations omitted). This passage can be read to imply that had Kodak presented undisputed evidence that it never changed its policy and that its policy was generally known, the Court would have considered Kodak copiers as the tying product and service and parts combined as the product being tied. *See* 10 PHILLIP E. AREEDA, ET AL., ANTITRUST LAW ¶ 1740c, at 150

(1996) ("The majority [in *Kodak*] apparently agreed with [the dissent] when it emphasized the absence of evidence that Kodak's policy was generally known."); *id.* at 157 ("[T]he *Kodak* majority indicated that it would assess the defendant's power in the interbrand machine market (where it had none) were it 'generally known' to machine buyers that the defendant supplied unique repair parts only in connection with its service, notwithstanding ignorance of lifecycle prices.").

Both the First and the Seventh Circuits have interpreted *Kodak* to be limited to situations in which the seller's policy was not generally known. *See Digital Equip. Corp. v. Uniq Digital Techs., Inc.*, 73 F. 3d 756, 763 (7th Cir. 1996) ("The Court did not doubt in *Kodak* that if spare parts had been bundled with Kodak's copiers from the outset, or Kodak had informed customers about its policies before they bought its machines, purchasers could have shopped around for competitive life-cycle prices. The material dispute that called for a trial was whether the change in policy enabled Kodak to extract supra-competitive prices from customers who had already purchased its machines."); *Lee v. Life Ins. Co. of North America*, 23 F.3d 14, 20 (1st Cir.), *cert. denied*, 115 S. Ct. 427 (1994) ("[T]he timing of the 'lock in' at issue in *Kodak* was central to the Supreme Court's decision. . . . Had previous customers known, at the time they bought their Kodak copiers, that Kodak would

implement its restrictive parts-servicing policy, Kodak's 'market power,' i.e., its leverage to induce customers to purchase Kodak servicing, could only have been as significant as its [market power] in the copier market, which was stipulated to be inconsequential or nonexistent.").

We likewise agree that the change in policy in *Kodak* was the crucial factor in the Court's decision. By changing its policy after its customers were "locked in," Kodak took advantage of the fact that its customers lacked the information to anticipate this change. Therefore, it was Kodak's own actions that increased its customers' information costs. In our view, this was the evil condemned by the Court and the reason for the Court's extensive discussion of information costs. While PSI's argument seems to suggest that *Kodak* supports a finding of market power whenever information costs are present, such a position cannot be reconciled with *Jefferson Parish*. In *Jefferson Parish*, the plaintiff argued there were various "market imperfections" that enabled the hospital to charge noncompetitive prices and that saddled the consumers with inadequate information, which in turn "render[ed] consumers unable to evaluate the quality of the medical care provided by competing hospitals." 466 U.S. at 27. Dismissing this argument, the Court responded that "[w]hile these factors may generate 'market power' in some abstract sense, they do not generate the kind of market power that justifies

condemnation of tying." *Id.* Put another way, the Court rejected the premise that imperfect consumer information resulting from basic market imperfections could be used as a basis to infer market power for purposes of the Sherman Act. We are unwilling to conclude that *Kodak* overruled this portion of *Jefferson Parish*, especially because the Court in *Kodak* cites *Jefferson Parish* with approval in its general discussion of market power. *Kodak*, 504 U.S. at 464.

In light of our reading of *Jefferson Parish* and *Kodak*, we thus hold that an antitrust plaintiff cannot succeed on a *Kodak*-type theory when the defendant has not changed its policy after locking-in some of its customers, and the defendant has been otherwise forthcoming about its pricing structure and service policies. This rule should encourage manufacturers to divulge all relevant information at the time of sale. While we recognize that some information costs will still exist even with full disclosure by a seller, *see* Mark R. Patterson, *Product Definition, Product Information, and Market Power: Kodak in Perspective*, 73 N.C. L. REV. 185, 215-216 (1994) ("The buyer's pre-purchase knowledge of a tie allows her only to anticipate those additional costs of the tie about which she knows prior to the purchase; it does not reduce the effects of the information costs that prevented buyers of Kodak equipment from accurately determining lifecycle prices."), these additional information costs stem from the fact that our economy is not one of perfect

information, a factor that alone should not invoke antitrust condemnation. Accepting PSI's argument would expose many manufacturers of durable, expensive equipment to potential antitrust liability for having inherent power over the aftermarkets of their products, a result certainly not intended by *Kodak* and not consistent with *Jefferson Parish*.

The present dispute provides an ideal example as to how our reading of *Kodak* can be applied in practice. In this case, there are no allegations that Honeywell changed its parts-restrictive policy in order to lock-in customers, nor has PSI alleged that Honeywell's policy was not generally known. There also is evidence that Honeywell and its customers engage in lengthy negotiations before the sale of Honeywell equipment. J.A. at 270. This fact is hardly surprising in light of the substantial price of the equipment. The record also contains evidence that Honeywell will provide estimates of service costs and failure rates of various parts if asked by its customers, J.A. at 1339, 1342, and that it offers various service plans to enable the customers more accurately to estimate the cost of the equipment. J.A. at 974-76. All of these actions by Honeywell reduce the information costs faced by its consumers. If there were any evidence in the record that Honeywell took advantage of its customers' imperfect information in order to reap supracompetitive profits in the aftermarkets for its equipment, we would not hesitate to allow a *Kodak*-type theory to be

submitted to the jury. However, we can find nothing in the record or PSI's brief that alleges that Honeywell engaged in such activities. In this situation a *Kodak*-type theory is not applicable. Since PSI has not alleged or shown that Honeywell has market power in the relevant market--the primary equipment market--summary judgment is appropriate in favor of Honeywell on PSI's § 1 claim.

IV. THE MONOPOLY CLAIM

PSI contends the district court erred by granting summary judgment in favor of Honeywell on PSI's § 2 monopoly claim. "The offense of monopoly under § 2 of the Sherman Act has two elements: (1) the possession of monopoly power in the relevant market and (2) the willful acquisition or maintenance of that power as distinguished from growth or development as a consequence of a superior product, business acumen, or historic accident." *Kodak*, 504 U.S. at 481 (quoting *United States v. Grinnell Corp.*, 384 U.S. 563, 570-71 (1966)). As was the case in *Kodak*, our § 1 analysis of the relevant market largely dictates our § 2 conclusion on this issue as well. Thus, our conclusion that the relevant market in this case is the primary equipment market is equally applicable here. Section 2 does, however, require a greater market share for a finding of market power than does § 1. *Kodak*, 504 U.S. at 481; *Fortner Enterprises, Inc. v. United States Steel Corp.*, 394 U.S. 495, 502 (1969). While there is no magical percentage of market power that

will qualify as monopoly power under § 2, the Supreme Court has concluded that an 87% share of the market and over two-thirds of the market both constitute monopoly power under § 2. *See United States v. Grinnell Corp.*, 384 U.S. 563, 571 (1966) (87% of market constitutes a monopoly); *American Tobacco Co. v. United States*, 328 U.S. 781, 797 (1946) (over two-thirds of market constitutes a monopoly).

In this case, PSI alleges that Honeywell possesses monopoly power in the market for circuit-board repair services, and that it willfully acquired this monopoly power by restricting the availability of its brand of circuit-board components. While the district court made no findings regarding the relevant market, it concluded that Honeywell had an absolute right to refuse to deal in its proprietary components, and that, because of this fact, Honeywell had legitimate reasons for acquiring whatever market power it had. In other words, the district court concluded that even if Honeywell had monopoly power in the market for circuit-board repair services, it achieved that power as a result of legitimate reasons, namely the proprietary nature of its components. In light of our holding on the relevant-market issue, however, the district court's analysis, which focused on Honeywell's reasons for acquiring and maintaining power in the market for circuit-board repair services, is no longer applicable. Because we have limited the relevant market in

this case to the primary equipment market, PSI can no longer rely on any power that Honeywell may have in the market for circuit-board components and repair services as a basis for § 2 liability. Therefore, because PSI has not shown that Honeywell possesses market power in the relevant market, i.e., the primary equipment market, summary judgment likewise was appropriate in favor of Honeywell on the § 2 claim.

Even if PSI had produced evidence regarding Honeywell's share of the primary equipment market, and even if we assume, for summary judgment purposes, that Honeywell has monopoly power in the market for its equipment, PSI must satisfy the second part of the § 2 analysis, i.e., it must show that Honeywell willfully acquired or maintained this alleged monopoly power. *Kodak*, 504 U.S. at 481. This requirement of proving exclusionary conduct also poses an insurmountable obstacle for PSI.

PSI's entire theory in this case revolves around Honeywell's practices in the circuit-board repair market. As stated throughout this opinion, PSI contends that Honeywell's domination of the market for Honeywell-brand components has foreclosed PSI from the repair market for Honeywell circuit boards. Nowhere does PSI allege that Honeywell willfully sought to acquire monopoly power in the market for industrial control equipment, a market in which PSI does not

compete and does not seek to enter. Nor does PSI contend that Honeywell's parts-restrictive policy has allowed Honeywell to achieve and maintain monopoly power in the market for industrial control equipment. *See* 3 PHILLIP AREEDA & DONALD F. TURNER, ANTITRUST LAW ¶ 626c (1978) ("'[E]xclusionary' behavior should be taken to mean conduct other than competition on the merits, or other than restraints reasonably 'necessary' to competition on the merits, *that reasonably appear[s] capable of making a significant contribution to creating or maintaining monopoly power.*") (emphasis added). If anything, a restrictive service policy would encourage competition in the primary equipment market. PSI, therefore, cannot establish that Honeywell's practices in the parts and services markets--not relevant markets in this dispute--have contributed to Honeywell's power in the market for industrial control equipment. Therefore, PSI fails the second part, as well as the first part, of the § 2 analysis.

V. CONCLUSION

We conclude that because Honeywell's parts-restrictive policy has been consistently maintained and generally known, and because Honeywell has otherwise been forthcoming about its pricing structure and service policies, the primary equipment market in this case comprises the relevant market for purposes of both §§ 1 and 2 of the Sherman Act. Accordingly, relying on these grounds, since

PSI has not alleged or shown that Honeywell has market power in the relevant (primary equipment) market, we **AFFIRM** the judgment of the district court.

APPENDIX B

UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF MICHIGAN
SOUTHERN DIVISION

MEMORANDUM AND ORDER

Civil No. 93-71277
entered January 5, 1995

UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF MICHIGAN
SOUTHERN DIVISION

PSI Repair Services, Inc., a Michigan corporation, *Plaintiff-Appellant,*		
v.	>	Civil No. 93-71277
Honeywell, Inc., a foreign corporation, *Defendant-Appellee.*		

MEMORANDUM AND ORDER

This is an antitrust case. Plaintiff, an independent service organization engaging in repairing electronic equipment among other things, has accused defendant of violating Section 1 of the Sherman Antitrust Act, 15 U.S.C. § 1, by tying the market for its circuit board components to the market for repair of its circuit boards, and of violating Section 2, 15 U.S.C. § 2, by seeking to "reduce competition by restricting the availability of circuit board components to

competitors such as [plaintiff]; refusing to sell competitors . . . circuit board components, and otherwise erecting entry barriers into the market" (Letter to Court of plaintiff dated December 8, 1994). Plaintiff says "As to [defendant's] market share, [defendant] is essentially the sole source of circuit board components for its equipment, giving [defendant] virtually a 100% share of the market for circuit board components and a 100% share of the market for circuit board repairs" id.

On December 15, 1994, following a two day evidentiary hearing in accordance with the Supreme Court's admonition to "resolve anti-trust claims on a case-by-case basis, focusing on the particular facts disclosed by the record,'" Eastman Kodak, Inc. v. Image Technical Services, 112 S. Ct. 2072, 2082 (1993) (quoting Maple Flooring Mfrs. Assn. v. United States, 268 U.S. 563, 579 (1929)), the Court granted defendant's motion for summary judgment on the tying claim. The Court's decision was based on the essential finding that there was no genuine issue over the material fact that there were not separate markets for parts for circuit boards manufactured by defendant and for the service of such boards. The record established that rather than repair such boards defendant replaced defective boards with new boards or with boards that were returned for replacement and then re-manufactured or restored to new condition and placed in inventory. As to parts, the record established that 95% of

board components were commercially available and that 5% were proprietary to defendant. As to these 5%, the Court cited with approval the First Circuit decision in Data General Corp. v. Grumman Systems Support Corp., 36 F.3d 1147 (1st Cir., 1994), which holds that a unilateral refusal to sell proprietary technology does not make out a Section 2 claim.

The Supreme Court in Eastman Kodak described a Section 2 claim as follows:

> "The offense of monopoly under § 2 of the Sherman Act has two elements: (1) the possession of monopoly power in the relevant market and (2) the willful acquisition or maintenance of that power as distinguished from growth or development as a consequence of a superior product,business acumen, or historical accident." United States v. Grinnell Corp., 384 U.S., at 570-571.

112 S. Ct. at 2089, and went on to say as to the second element:[1]

> [15] The second element of a § 2 claim is the use of monopoly power "to foreclose competition, to gain

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[1]There is no question that the only source of replacement boards is defendant.

a competitive advantage, or to destroy a competitor." United States v. Griffith, 334 U.S. 100, 107, 68 S.Ct. 941, 945, 92 L.Ed. 1236 (1948). If Kodak adopted its parts and service policies as part of a scheme of willful acquisition or maintenance of monopoly power, it will have violated § 2. Grinnell Corp., 384 U.S., at 570-571, . . .; United States v. Aluminum Co. of America, 148 F.2d 416, 432 (CA2 1945); Aspen Skiing Co. v. Aspen Highlands Skiing Corp., 472 U.S. 585, 600-605.

. . . . .

112 S. Ct. at 2090 and:

As recounted at length above, respondents have presented evidence that Kodak took exclusionary action to maintain its parts monopoly and used its control over parts to strengthen its monopoly share of the Kodak service market. Liability turns, then, on whether "valid business reasons" can explain Kodak's actions. Aspen Skiing Co., 472 U.S., at 605, . . .; United States v. Aluminum Co. of America, 148 F.2d at 432.

112 S. Ct. at 2091.

Here the only thing defendant has done is maintain its right to proprietary technology by declining to make available

to the market the proprietary components that make up part of its circuit boards. Under such circumstances there is no genuine issue of material facts which is ripe for jury determination.

Accordingly, defendant is entitled to summary judgment on the Section 2 claim of monopoly.

SO ORDERED.

/s/ Avern Cohn
AVERN COHN
UNITED STATES DISTRICT JUDGE

DATED: JAN 5, 1995
Detroit, Michigan

APPENDIX C

UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF MICHIGAN
SOUTHERN DIVISION

FINDINGS AND CONCLUSIONS AND ORDER

Civil No. 93-71277
entered March 9, 1995

UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF MICHIGAN
SOUTHERN DIVISION

PSI Repair Services, Inc., a Michigan corporation, *Plaintiff-Appellant,*		
v.	>	Civil No. 93-71277
Honeywell, Inc., a foreign corporation, *Defendant-Appellee.*		

FINDINGS AND CONCLUSIONS AND ORDER

I.

This is an antitrust case. The background of the case is briefly described in the Memorandum And Order of January 5, 1995 dismissing plaintiff's 15 U.S.C. § 2 claim (restriction of competition) (see copy attached). Previously the Court dismissed plaintiff's § 1 claim (illegal tying) from the bench after a 2 day evidentiary hearing to determine

whether or not there were any genuine issues of material fact to be tried to a jury. The Court found there were no genuine issues of material fact. Regretfully the Court's reasons were not clearly stated. What follows are the Court's findings and conclusions supporting dismissal of the § 1 claim.

II.

The case was filed on March 24, 1993. Plaintiff is in the business of repairing a variety of industrial machines and components, including electronics such as circuit boards which control computer managed machinery and industrial processes such as refineries, chemical plants, paper mills and the like. Defendant is a 6 billion dollar per year manufacturing company which includes in its product line complex electronic systems using computers which in turn use circuit boards. Plaintiff's complaint alleges violation of 15 U.S.C. §§ 1 and 2. The essence of the § 1 claim is that defendant illegally ties the sale of parts and the use of labor in repairing circuit boards.

Defendant moved for summary judgment on both claims. The motion papers were preceded by extensive discovery. Defendant's motion papers included a Statement Of Material Undisputed Facts and plaintiff's papers included a Statement Of Material Disputed Facts. In advance of the evidentiary hearing because of an unanswered question in the motion papers, the Court advised the parties in writing of the

objectives of the hearing. The Court, also with the agreement of the parties, visited an oil refinery to observe the placement and operation of circuit boards.

At the evidentiary hearing the president and a senior officer of defendant's Industrial Controls Division testified as did the chief operating officer of plaintiff. During and at the conclusion of the hearing the Court made statements relating to its findings and conclusions that there were no genuine issues of material fact. Following the hearing, defendant filed proposed findings of fact and conclusions of law to which plaintiff responded.

III.

Essentially the Court found there are not separate markets for parts for the circuit boards manufactured by defendant and for the servicing of circuit boards when a board requires repair or replacement. In fact, repair and replacement are one and the same thing since the record established that rather than repair circuit boards on-site or at a repair facility, defendant replaces a circuit board which goes bad with a new board or with a board that is returned to defendant and remanufactured and restored to a like new condition and placed in inventory. In short, defendant does not have a traditional repair operation. As to the parts which go to make up a board, 95% of such parts are commercially available and 5% are proprietary. Defendant's right to

maintain control over proprietary parts is explained in the Memorandum And Order of January 5, 1995.

IV.

As to the facts:

A.

1. Defendant is a Delaware corporation headquartered in Minneapolis and has three business arms. Space and Aviation deals in aircraft, missiles and satellite systems. Commercial Buildings deals in equipment and systems for commercial buildings. Industrial Automation and Control manufactures and installs automation and control equipment and systems.

2. Industrial Automation and Control is located in Phoenix, Arizona. There a line of systems is assembled commonly referred to as process control equipment. The product line at issue in this case is the TDC 2000, sold from 1974 to 1975, and an improved version known as the TDC 3000 sold since 1978. The systems are automatic and monitor and control the operation of various industrial facilities such as oil refineries, paper mills, chemical plants and the like. A TDC computer system is the "brain" of each of these operations. Circuit boards are the central components of each computer system.

3. A TDC system consists of hardware and software in a series of modules performing various electronic functions. The modules are made up of cabinets, hard drives, power supplies and consoles linked together by cables. The circuit boards are comprised of a thin rectangle of fiberglass, laminated with copper foil. Resistors, capacitors and a variety of integrated circuits are soldered into metal pads embedded within a circuit board. The copper foil creates pathways between the components. On occasion a circuit board will fail and must be replaced. Defendant replaces about 4,000 to 5,000 circuit boards per year.

4. Defendant also manufactures stand alone systems known as the PLC and the UDC. The PLC is a controller used in the automobile industry. Defendant has sold most of this business. UDC is a device used for temperature control analogous to a thermostat. These are technologically less sophisticated products than the TDC and there is no carry-over, factually or legally, to the issues raised by plaintiff's complaint and the findings and conclusions of the Court.

5. Each TDC system is custom designed to fit a customer's particular needs. The average price of a system is $600,000 to $800,000. Each system can have several hundred circuit boards.

6. When installed, the modules in a TDC system are linked by cables to transmitters, sensors, valves and switches which give direction to the equipment in a plant. People communicate with the system by CRT monitors, control panels and keyboards.

7. Defendant sells replacement parts for systems which it has installed, such as cathode ray tubes, disk drives, printers, cables, cabinets, and various types of circuit boards. Defendant sells circuit boards to anyone without restriction. For one or two various large buyers of TDC systems defendant has sold components of the circuit boards since these customers have the capability of repairing boards in their own facilities. The exact manner in which defendant and these particular customers operate was not explained at the evidentiary hearing. In any event, it is not a business practice of defendant to sell circuit board components.

8. The circuit boards have approximately 10,000 different types of components. Generally, there are three types of components: standard discrete components, such as resistors, capacitors, and connectors; standard, market-available, integrated circuits; and custom integrated circuits, sometimes known as "ASIC's" or Application Specific Integrated Circuits. The custom integrated circuits are designed by defendant.

9. Approximately 95% of a circuit board's components are standard, off-the-shelf items readily available to plaintiff. The remaining 5% are proprietary to defendant. The proprietary components are designed, manufactured and tested according to defendant's specifications, or they have defendants "firm ware" loaded into them. "Eirm ware" is a type of software permanently programmed and stored in PROM (Programmable Read Only Memory). The proprietary components involve substantial design costs to defendant. A circuit board cannot be repaired without access to the proprietary components. There is no listing of the components of a circuit board in the record.

10. Defendant does not manufacture components. A manufacturer of a proprietary component places defendant's part number on it.

11. Defendant does not sell individual components, with rare exception, and there is no consumer demand for them. The record evidence offered by plaintiff to support its contention of consumer demand is de minimums.

12. Defendant does not provide customers with a list of circuit board components. A packing list identifies the modules used in the system delivered.

13. With regard to circuit boards which become defective, defendant operates an exchange program which makes available to a customer a new or "as new" circuit board at a discount price. The customer contacts a Customer Service Center and requests a replacement board. A replacement circuit board is shipped overnight from inventory. The price for a replacement circuit board is 50% of list provided the defective circuit board is returned. While much was made of "repair and exchange" and "repair and return" services by defendant, the record evidence does not support a finding that there is a genuine dispute over the manner in which defendant deals with defective boards. A defective board when returned which is capable of being repaired is in fact remanufactured to current standards, tested, and placed in inventory.

14. A defective circuit board returned to defendant becomes defendant's property. Most defective circuit boards which are returned are scrapped. Defendant does not distinguish in its inventory between circuit boards which have been newly manufactured and circuit boards which are returned as defective and remanufactured and put in inventory. A customer is not told which type of circuit board it gets in exchange for a defective board which is returned.

15. On rare occasions and because of specific reasons, i.e. in the nuclear industry, a particular defective circuit board

may be repaired and returned to the customer. This occurs less than 1% of the time. Also, one or two large users of circuit boards do their own repairs with components purchased from defendant. This is a de minimums activity.

16. Generally customers perform circuit board replacement. That is, the customer removes the defective circuit board, returns it to defendant, and installs the replacement circuit board shipped by defendant.

B.

1. Plaintiff is a Michigan Corporation with its principal place of business in Livonia. It repairs various kinds of industrial equipment including circuit boards. Repair work on circuit boards.

Plaintiff says that the tie is established by the fact that defendant sells these two items together in the form of replacement circuit boards. Resolution of the dispute between the parties rests on whether there is evidence of record from which to conclude there is sufficient consumer demand for circuit board components separate and distinct from market demand for board repair services. See Montgomery County Association of Realtors, Inc. v. Realty Photo Master Corporation, 783 F. Supp. 952 (D. Mary. 1992) aff'd 993 F.2d 1538 (4th Cir. 1993).

3. Not only is there no evidence of consumer demand for circuit board components or of market demand for circuit board repair services, there is nothing in the record to warrant a trial to make such a determination. The only evidence of record, aside from plaintiff's demand for components, supports the conclusion that defendant's customers for TDC systems do not seek to purchase the components of defective circuit boards separately and the labor needed to assemble these circuit boards separately.

4. Defendant charges a single price for replacement of a defective circuit board. It does not charge for time and materials separately.

5. Plaintiff's emphasis has been on what occurs after the defective circuit board has been returned, i.e. whether defendant repairs or remanufactures the circuit board or scraps it. Repair is an incorrect characterization of what defendant does since the work on a defective circuit board includes upgrading it to current standards as well as testing it in the same fashion as newly
manufactured circuit boards.

6. What is really involved is plaintiff's complaint that defendant refuses to deal with it in the sale of the proprietary components of circuit boards. That claim has been separately decided as having no merit.

VI.

The Court finds that there is no genuine issue of material fact necessitating a trial of plaintiff's § 1 claim. Accordingly, defendant's motion for summary judgment is GRANTED and this case is DISMISSED, the Court having previously granted summary judgment in favor of defendant on plaintiff's remaining claim.

SO ORDERED.

/s/ Avern Cohn
AVERN COHN
UNITED STATES DISTRICT JUDGE

DATED: MAR 9, 1995
Detroit, Michigan

APPENDIX D

UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF MICHIGAN
SOUTHERN DIVISION

JUDGMENT

Civil No. 93-71277
entered March 9, 1995

United States District Court

EASTERN DISTRICT OF MICHIGAN

PSI Repair Services, Inc., *Plaintiff-Appellant,*	**JUDGMENT IN A CIVIL CASE**
v.	Case No. 93-71277
Honeywell, Inc., *Defendant-Appellee.*	

☐ **Jury Verdict.** This action came before the Court for a trial by jury. The issues have been tried and the jury has rendered its verdict.

☒ **Decision by Court.** This action came to hearing before the Court. The issues have been heard and a decision has been rendered.

IT IS ORDERED AND ADJUDGED that defendant's motion for summary judgment is GRANTED and the above case is DISMISSED.

March 9, 1995
Date

JOHN P. MAYER
Clerk

/s/ Judy Cassady
(By) Deputy Clerk Judy Cassady

APPENDIX E

STATUTES

15 U.S.C. § 1

15 U.S.C. § 2

§ 1. Trusts, etc., in restraint of trade illegal; exception of resale price agreements; penalty

Every contract, combination in the form of trust or otherwise, or conspiracy, in restraint of trade or commerce among the several States, or with foreign nations, is declared to be illegal: *Provided,* That nothing contained in sections 1 to 7 of this title shall render illegal, contracts or agreements prescribing minimum prices for the resale of a commodity which bears, or the label or container of which bears, the trademark, brand, or name of the producer or distributor of such commodity and which is in free and open competition with commodities of the same general class produced or distributed by others, when contracts or agreements of that description are lawful as applied to intrastate transactions, under any statute, law, or public policy now or hereafter in effect in any State, Territory, or the District of Columbia in which such resale is to be made, or to which the commodity is to be transported for such resale, and the making of such contracts or agreements shall not be an unfair method of competition under section 45 of this title: *Provided further,* That the preceding proviso shall not make lawful any contract or agreement, providing for the establishment or maintenance of minimum resale prices on any commodity herein involved, between manufacturers, or between producers, or between wholesalers, or between brokers, or between factors, or between retailers, or between

persons, firms, or corporations in competition with each other. Every person who shall make any contract or engage in any combination or conspiracy declared by sections 1 to 7 of this title to be illegal shall be deemed guilty of a misdemeanor, and, on conviction thereof, shall be punished by fine not exceeding fifty thousand dollars, or by imprisonment not exceeding one year, or by both said punishments, in the discretion of the court. July 2, 1890, c. 647, § 1, 26 Stat. 209; Aug. 17, 1937, c. 690, Title VIII, 50 Stat. 693; July 7, 1955, c. 281, 69 Stat. 282.

§ 2. Monopolizing trade a misdemeanor; penalty

Every person who shall monopolize, or attempt to monopolize, or combine or conspire with any other person or persons, to monopolize any part of the trade or commerce among the several States, or with foreign nations, shall be deemed guilty of a misdemeanor, and, on conviction thereof, shall be punished by fine not exceeding fifty thousand dollars, or by imprisonment not exceeding one year, or by both said punishments, in the discretion of the court. July 2, 1890, c. 647, § 2, 26 Stat. 209; July 7, 1955, c. 281, 69 Stat. 282.

APPENDIX F

LAW REVIEW ARTICLE:

ANTITRUST POLICY
IN AFTERMARKETS

Severin Borenstein
Jeffrey K. MacKie-Mason
Janet S. Netz
1995

ANTITRUST POLICY IN AFTERMARKETS

SEVERIN BORENSTEIN
JEFFREY K. MACKIE-MASON
JANET S. NETZ*[1]

Many recent antitrust cases concern aftermarkets: markets for goods or services used together with durable equipment but purchased after the consumer has invested in the equipment. Examples include computer parts, software upgrades, repair manuals, and training. Durable goods manufacturers are often the dominant providers of aftermarket products. The cases involve a variety of alleged anticompetitive aftermarket behaviors by durable goods manufacturers, especially ties between proprietary and non-proprietary aftermarket services. For example, equip-

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* [1]Severin Borenstein is Director, University of California Energy Institute; Professor of Economics, University of California, Davis. Jeffrey K. MacKie-Mason is Associate Professor of Economics and Public Policy, University of Michigan. Janet S. Netz is Assistant Professor of Economics, Krannert School of Management, Purdue University. The authors prepared this article for the FTC/DOJ/ABA/GULC Conference, Post-Chicago Economics: New Theories—New Cases?, Washington, D.C., May 26-27, 1994. The authors are grateful to participants at the conference and especially to Joseph Farrell for very helpful discussions, and thank Paul Yde and an anonymous referee for helpful editorial advice.

ment maintenance has been tied to: parts;[1] software upgrades;[2] diagnostic software and manuals;[3] engineering changes and timing diagrams;[4] and emergency service calls.[5] In all of the cases, the plaintiffs allege that customers are "locked in" by their prior investment in the manufacturer's proprietary equipment brand, and thus are limited (to a greater or lesser degree) to aftermarket products specifically compatible with that brand.

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[1]*See, e.g.*, Eastman Kodak Co. v. Image Technical Servs., Inc. 112 S. Ct. 2072 (1992); Electronics in Medicine v. Picker Int'l, Case No. H89-3283 (S.D. Tex. 1989); Imaging Equip. Servs. v. Picker Int'l, Case No. 87-2828-WF (D. Mass. 1987).

[2]*See, e.g.*, Virtual Maintenance, Inc. v. Prime Computer, Inc., 957 F.2d 1318 (6th Cir.), *vacated*, 113 S. Ct. 314 (1992) *(Virtual I)*, *on remand*, 995 F.2d 1324 (6th Cir. 1993) *(Virtual II)*; Systemcare, Inc. v. Wang Laboratories, Inc. 787 F. Supp. 179 (D. Colo. 1992); CommTract Corp. v. Northern Telecom, Inc., No. 90-13088-WF (D. Mass. 1990).

[3]*See, e.g.*, Datasat Co. v. Unisys Corp., No. 92-1442-G (S.D. Cal. 1992); Grumman Systems Support Corp. v. Data General Corp., No. 88-0033-S (D. Mass. 1988); Imaging Equip. Servs. v. Picker Int'l, Case No. 87-2828-WF (D. Mass. 1987).

[4]*See, e.g.*, Grumman Systems Support Corp. v. Data General Corp., No. 88-0033-S (D. Mass. 1988).

[5]*See, e.g.*, HyPoint Tech., Inc. v. Hewlett-Packard Co., 949 F.2d 874 (6th Cir. 1991); Comm-Tract Corp. v. Northern Telecom, Inc., No. 90-13088-WF (D. Mass. 1990).

These cases involve many standard antitrust issues. For example, in a case where the manufacturer ties the availability of proprietary parts to the purchase of service (labor) from the manufacturer, the standard tying question arises: When can a firm with monopoly power over a proprietary product increase its monopoly profits by tying the proprietary product to another product? This question has been extensively addressed elsewhere.[6] What is novel in aftermarkets cases is not the interactions between various different aftermarket products, but the interactions between the aftermarkets and the market for the original sale of the durable equipment.

It is this relationship *between* aftermarkets and the original equipment market on which we focus. In particular, we address three questions:

(1) Is it possible for a manufacturer to exercise market power profitably in aftermarkets if the primary equipment market is competitive? What effect does less than perfect competition in the equipment market have on aftermarket performance?

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[6]*See, e.g.*, Michael Whinston, *Tying, Foreclosure and Exclusion*, 80 AM. ECON. REV. 837 (1990) (showing how tying can increase profits through strategic entry deterrence). See JEAN TIROLE, THE THEORY OF INDUSTRIAL ORGANIZATION 333—35 (1988), for a textbook discussion of a number of other roles for tying.

(2) How much are consumers harmed overall by supracompetitive pricing in aftermarkets if competition in the primary market forces equipment price reductions?

(3) If constraints on the link between equipment pricing and aftermarket pricing lead to consumer harm, is contract law the proper tool for policy response?

We conclude that a manufacturer can profitably exercise market power in the aftermarket and will set an effective aftermarket price that is higher than the competitive level; consumers are harmed to some degree by this outcome; and that contracts often are not practically feasible to protect consumers.[7]

We show in Part I that manufacturers will, in general, find it optimal to charge supracompetitive aftermarket prices, even though it costs them some sales in the primary market. This is true even if the manufacturer expects to be in business for many years and considers the effect of aftermarket prices on future equipment sales. Indeed, the result holds so long as completely contingent long-term contracts are economically infeasible. We

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[7]These conclusions hold under quite general assumptions. The minor caveats are detailed in the sections below.

discuss why such perfect contracts are, in fact, rarely feasible in Part III.

Competition in the primary market will have the effect of reducing equipment prices as aftermarket prices rise, so that sellers break even overall. But we show in Part II that, in general, consumers are still harmed by the deviations from cost-based prices for aftermarket goods. Even when consumers are well informed and the equipment market is long-lived so sellers have an incentive to build a reputation, consumers are still worse off than they would be if there were no market power in the aftermarket.[8] How much consumers suffer is a factual question, the answer to which will vary on a case-by-case basis; we describe a number of factors that affect how large the harm is likely to be in any specific case. Thus, when the conditions for aftermarket power are met, we expect to see some consumer harm in virtually all cases, although not always enough harm to warrant antitrust remedy.

The third question, whether contract law or antitrust law will be more useful in remedying the problem, is less amenable to simple economic modeling. The social return to costly adjudication in an antitrust court depends on the

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[8]Only if the equipment and the aftermarket products are purchased in strictly fixed proportions do consumers suffer no harm. This is not likely to be true. *See infra* Part II.

size of consumer harm and the effectiveness of available contractual remedies, both of which are factual questions. We do note, however, that contracting effectiveness depends heavily on the Supreme Court's central observation in *Kodak:* information is costly and necessarily imperfect and uncertain for such complex, long-lived equipment as the aftermarket cases feature. These information imperfections tend to make perfect, complete contracting infeasible and thus make contract law less useful in aftermarket cases.[9]

Whether antitrust remedy is appropriate in a given case, of course, depends on the ways in which the firm exploits its aftermarket power. Charging high prices for proprietary parts, for example, would usually not be an antitrust violation. Using leverage from a legitimate parts monopoly to obtain monopoly control of maintenance (through tying, refusal to deal, and other devices) may provoke legitimate antitrust concern. We do not attempt to analyze the antitrust status of different types of aftermarket actions; that is a standard problem. Our purpose, rather, is to develop a general economic theory of the possibility of antitrust violation.

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[9]Joseph Earrell & Carl Shapiro, Optimal Contracts with *Lock-In*, 79 Am. Econ. Rev. 51 (1989) (showing that consumers can actually be worse off with a long-term contract than without if the contract does not cover all significant dimensions)

Our theoretical conclusions are quite strong. Under most plausible circumstances, a manufacturer of durable equipment will find it rational to act anticompetitively in aftermarkets (given some proprietary advantage); overall, consumers will be harmed; and the conditions that tend to make the harm great also tend to reduce the effectiveness of contractual remedies. Consequently, although the appropriateness of antitrust remedy will vary from case to case, economic analysis clearly permits a role for antitrust scrutiny.

I. WILL COMPETITIVE MANUFACTURERS CHARGE ABOVE-COST AFTERMARKET PRICES?

A. THE SUPREME COURT'S VIEW

In its decision in *Eastman Kodak Co. v. Image Technical Services, Inc.*, the Supreme Court recognized the possibility of rational anticompetitive behavior in aftermarkets when the original equipment market is competitive.[10] The Court noted that firms operating in both an equipment market and an aftermarket face a trade-off: while above-competitive pricing in the aftermarket may reduce future profits through lost customers, it also raises current profits in the aftermarket from locked-in

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[10]112 S. Ct. 2072 (1992); *see also* Virtual Maintenance Inc. v. Prime Computer, Inc., 13 S. Ct. 314 (1992) (remanded to the Sixth Circuit on the same grounds).

customers. The Court argued that it could not presume that the lost future profits from lower equipment sales will outweigh the gain in current profits from supracompetitive pricing in the aftermarket.

The Court majority argued that even if competition in the equipment market theoretically prevents the use of market power in the aftermarket, market imperfections, in particular imperfect information and switching posts, can prevent economic theory from describing reality. If consumers do not have perfect information (for example, if they don't know the prices that other firms charge or it is costly to obtain such information), then a reputation is not as effective because consumers are less likely to know that there are firms with lower prices. Switching costs also limit the disciplining effect of equipment market competition on the aftermarket because consumers are locked in. In the presence of switching costs, consumers will pay supra-competitive aftermarket prices as long as the price premium is less than the switching costs. While the facts of an individual case may prove that it would not be profitable in a particular instance, the Court stated that economic theory alone cannot rule out such behavior.[11]

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[11]The Supreme Court was addressing a ruling of summary judgment. Kodak requested summary judgment before discovery was complete, arguing that, based on economic theory, competition in the equipment market precluded anticompetitive behavior in the aftermarket. The

Thus, the Court in *Kodak* held that aftermarket tying cases must be examined on the facts, case-by-case. In so holding, the Court emphasized that "market imperfections can keep economic theories about how consumers will react from mirroring reality."[12] The Court is correct that the above-mentioned imperfections will affect the degree of aftermarket exploitation that is possible. However, the emphasis on imperfections is much too accepting of the economic arguments the defendants have proffered. Economic theory does not support the argument that strong primary market competition will discipline aftermarket behavior, even without market imperfections. In fact, firms will rationally engage in above-cost aftermarket pricing even if the equipment market is very competitive, all parties are well informed, and demand in the market is stable. Supracompetitive prices for proprietary aftermarket goods and services will occur so long as there is an inability to

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Supreme Court ruled that the possibility of anticompetitive behavior (that is, whether an aftermarket can be a "relevant market") is a factual question, and that the issue should go to trial after full discovery. Justice Scalia's dissent also emphasized the role of market imperfections, though in his opinion imperfect information and switching costs were not sufficient to prevent competition in the equipment market from disciplining aftermarkets. 112 S. Ct. at 2097. See *infra* Part IV, for a discussion of a case in which the facts have already been heard in trial.

[12] *Id.* at 2078.

contract for these goods and services at the time of purchase.

B. ECONOMIC MODEL

We address the issue of whether competition in the equipment market will discipline aftermarket pricing in the simplest possible setting in order to highlight the manufacturer's incentives.[13] We then discuss how more realistic conditions affect our conclusions.

A variety of monopolistic practices have been alleged, but to focus attention on the relevant issues we consider generic monopoly pricing in proprietary aftermarkets. Of course, if the manufacturer exercises market power simply by raising price, antitrust laws are not invoked. However, the supracompetitive aftermarket profits attract entry, at which point the manufacturer has an incentive to exclude competition in the aftermarket. Indeed, virtually all of the cases have been brought by aftermarket firms that allege anticompetitive behavior on the part of the equipment manufacturer, especially in the form of tie-ins. Our results carry over to tying and other exclusionary

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[13]A formal model of pricing in a proprietary aftermarket is presented in Severin Borenstein, Jeffrey MacKie-Mason & Janet Netz, Market Power in Proprietary Aftermarkets (unpublished manuscript 1994).

aftermarket practices that effectively result in higher aftermarket prices to consumers.

To keep the discussion simple we begin by assuming that consumers are well informed: they know current prices and are able to use that information to form an estimate of the life-cycle cost of their purchases (including equipment and aftermarket products and services). These extreme, simplifying assumptions focus attention on the situations in which it would seem least likely to find aftermarket power. We also assume that the market for equipment has many competing sellers, each with a brand that is equally appealing to consumers.[14] We assume, however, that the aftermarket product is proprietary, so each equipment manufacturer has a complete monopoly over the sale of aftermarket products for its equipment brand. Finally, we assume that each firm acts to maximize the present discounted value of all present and future profits to the firm, so it takes into account the effect of its decisions on its contemporaneous profits and on all of its future profits.[15]

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[14]Thus, we are assuming the same market conditions that were posited by Justice Scalia in his *Kodak* dissent, rather than the imperfect market conditions relied on by the majority. 112 S. Ct. at 2097.

[15]By "discounting", we mean that the firm values one dollar of income earned in the future less than it values a dollar earned today. It should do so because a dollar earned today can be invested and earn

Relaxing these assumptions (by incorporating the common market imperfections discussed by the Supreme Court in *Kodak,* for instance) serves to strengthen our conclusions. It is on the basis of developing our results under such unfavorable assumptions that we claim they are strong and quite general.

A firm selling both equipment and an associated proprietary aftermarket product faces a trade-off when it sets its aftermarket price. A higher price will allow it to earn more profits (up to a point) on aftermarket sales to consumers who have already purchased the equipment. On the other hand, a higher aftermarket price will also reduce sales of the equipment because potential buyers will take into account this higher expected cost of purchasing the associated aftermarket products. Defendants in antitrust aftermarket cases and the dissenting opinion of the Supreme Court in *Kodak* have argued that if the equipment market is sufficiently competitive, then the latter effect—which is often referred to as a reputation effect---will overwhelm the former effect-—-referred to as customer "lock-in"—--and firms will set prices for the proprietary aftermarket good at competitive levels.

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interest, giving the firm more than a dollar in the future. It is common to assume that the discount rate is approximately equal to the interest rate that the firm faces.

There is, however, no economic basis for this conclusion. In fact, the profit-maximizing firm that faces this trade-off will price above marginal cost in the aftermarket. For at least a small increase in price from marginal cost, the increased aftermarket profits earned on customers who have already purchased the equipment will exceed the losses from the resulting decline in reputation, and thus in future equipment sales. Further, this trade-off persists over the long term, as long as firms apply a positive discount rate to the value of future profits.

The simple (but not entirely correct) intuition is this: the manufacturer does not lose profits on new customers because it lowers the equipment price to compensate them for higher aftermarket prices.[16] But the manufacturer makes profits on existing customers because they have already bought their equipment and do not get compensated for the higher aftermarket prices.[17] Essentially, the manufacturer can discriminate against locked-in customers without (necessarily) losing new customers: competition in

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[16]New customers are those in the market to buy a piece of equipment. Some of these "new" customers will be customers who have purchased equipment previously and who are now replacing or upgrading old equipment.

[17]Existing customers refers to those who currently own a piece of equipment and are hence locked-in to the aftermarket of that particular manufacturer.

the new equipment market does not protect existing customers because they have already purchased the equipment.[18]

The complete theory is more complicated because the policy of combining high aftermarket prices with low equipment prices may not fully compensate new equipment customers. As a starting point, suppose new purchasers of equipment bought the same amount of the aftermarket product at the supracompetitive price as they would at the competitive price. If the quantity demanded of the aftermarket product did not change as the aftermarket price rose, then the total price of the entire system—equipment plus aftermarket product—could be held constant simply by adjusting downward the equipment price to offset a supracompetitive aftermarket price. Since, by assumption, the quantities purchased of equipment and service are unchanged, the seller's profit and new equipment buyer's net benefit would then also be the same as they would be with competitive aftermarket pricing (and the associated higher equipment prices). Raising the aftermarket price will affect consumer benefits and seller profits from new equipment sales only if it causes consumers to buy less of the

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[18]This "discrimination" does not require that the manufacturer knows which customers are new and which already own equipment. The discrimination results automatically when the price of equipment is reduced and the aftermarket price is raised.

aftermarket product.[19]

Of course, in reality, a high aftermarket price does reduce consumption of the aftermarket good and thus reduces the benefits of owning the equipment. For instance, a high price for copier toner will reduce the number of copies made on each machine regardless of the price of the copying machine. However, the loss in profits earned from new equipment buyers when the firm raises the aftermarket price and lowers the equipment price commensurately comes only from the change in purchases of the aftermarket product.

In contrast, the gain in profits from raising the after-market price to customers who have already purchased the equipment occurs on every aftermarket unit sold to them.[20] Overall, a small increase in the aftermarket price

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[19]In fact, we are making two further simplifying assumptions: potential aftermarket competitors will offer the same products or services as the manufacturer, and they will have the same production costs. We discuss below the additional harm to consumers if excluded competitors could have achieved lower costs or increased the variety of aftermarket products and qualities.

[20]Notice that we are postulating that the manufacturer raises the aftermarket prices to all consumers, and thus the manufacturer does not need to be able to identify new and existing consumers. We are simply dividing the analysis of the effect on profits between the two types of consumers.

raises profits on every aftermarket unit sold to existing customers, while lowering profits only on the change in aftermarket units sold to new customers. The analogous technical argument shows that overall profits will increase by raising the aftermarket price at least a little above marginal cost and offsetting that increase for new buyers by lowering the price of the equipment. How far the manufacturer can profitably raise the aftermarket price depends on the characteristics of the particular markets and customer demands.

It might appear that we are describing a short-run game here: firms can exploit currently locked-in customers, but all future customers for new equipment (and follow-on aftermarket products) are protected by competition in the equipment market. This is incorrect. We are allowing for an infinite number of future periods of new equipment purchasing, and the result is that the service price is above the competitive level (incremental cost) in every period. Furthermore, consumers are aware that the firm will follow this pricing strategy, so it is not a failure of reputation that causes the problem.[21]

What is happening that leads to this inefficient market outcome under free-entry (for equipment), complete

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[21]See *Infra* Part I.C, for our discussion of the role of reputation.

information, and rational fore-sight? Competition merely ensures that firms will earn zero excess profits. This will be true because firms will raise aftermarket prices but lower equipment prices correspondingly until net combined profits are zero. However, in any given period, for all time, the firm has some "currently locked-in customers. The trade-off described above always gives the firm the incentive to raise current service prices above the competitive level. Only fully contingent, complete long-term contracts could remove this incentive. Thus, period after period, new buyers get a below-cost price on equipment and a supracompetitive price on service. Since all future customers get a price break on equipment, does this prevent consumer harm from the above-cost aftermarket price? No: consumer welfare is lower in every period than it would be if both equipment and the aftermarket goods were priced competitively (at cost) because the consumer purchases less of the aftermarket product and hence gets less value from the equipment.

The argument that firms will price proprietary aftermarket products above the competitive level does not rely on any assumption about the degree of competition in the equipment market. In fact, the level of competition in the equipment market may have little or no impact on the

mark up of proprietary aftermarket products.[22] This makes sense because a firm has two decision variables that it can adjust to maximize profits: the equipment price and the aftermarket price. The equipment price affects the firm's competitiveness in attracting new (and repeat) buyers, but is not relevant to incumbent owners of the equipment who purchase only the aftermarket product. The aftermarket price, however, affects both potential new buyers and incumbent owners. Thus, the firm will use the aftermarket price to strike the optimal balance between profiting on customers who have already bought the equipment and maintaining a low-aftermarket-price reputation to attract new customers. It will then adjust the equipment price up or down as the intensity of competition among equipment manufacturers changes. More severe competition in the primary market will drive down the equipment price, but it does not necessarily change the trade-off that the firm faces in pricing the proprietary aftermarket product. Firms may even price equipment below cost in order to "buy" market share that will yield profits from high aftermarket prices. Thus, while competition in the equipment market lowers

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[22]Borenstein, MacKie-Mason & Netz, *supra* note 13, analyze a standard model of imperfect competition that is extended to include a proprietary aftermarket good. In that model, we show that the equilibrium price of the aftermarket good is independent of the degree of substitutability among equipment brands, even as the primary market becomes, in the limit, perfectly competitive

equipment prices and profits, it will not drive aftermarket prices to competitive levels.

It has been suggested that the need for a reputation for low-price aftermarket products means that firms can only exercise market power by surprising customers with changes in aftermarket prices and policies.[23] The possibility of ex post customer surprise is not necessary for the existence of aftermarket power, though it does enhance that power. The results explained above show that firms should always price their proprietary aftermarket products above "competitive" levels. Consumers anticipate these aftermarket prices, and their expectations are fulfilled.

C. BUILDING AND MAINTAINING A REPUTATION

It would seem that both firms and consumers could be better off if firms committed to charging competitive aftermarket prices. Of course, in a free-entry equilibrium the manufacturers earn zero profits in any case. However, when both prices deviate from cost (the equipment price is below cost and the aftermarket price above cost), consumers

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[23] *See*, e.g., Carl Shapiro & David Teece, *Systems Competition and Aftermarkets: An Economic Analysis of* Kodak, 39 ANTITRUST BULL.. 135 (1994); *see also Kodak*, 112 S. Ct. at 2098 (Scalia, J., dissenting).

are harmed: they will tend to buy less than a socially desirable amount of the aftermarket product.[24] If both prices could be set competitively, consumers would be made better off, and firms would try to raise profits by competing to bring these benefits to consumers.

For example, suppose that a consumer would buy ten units of the aftermarket product for use with her equipment if the aftermarket price were $50. If the aftermarket price were instead set at $35, then the consumer would benefit by more than the $150 she saves on the 10 units, because she would now buy more than 10 units. Presumably, the consumer is getting some value from the additional units she buys when the aftermarket price declines. As a result, the firm could accompany the aftermarket price cut with an equipment price increase of at least a little more than $150 and leave consumers, and the firm, better off.[25]

So, why doesn't some firm simply make a commitment to charge a competitive price for the

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[24]See *infra* Part I.D., for a further discussion of this and other harms to consumers.

[25]If the equipment market were perfectly competitive, firms would make zero economic profits in either scenario, but at any rate would be no worse off.

aftermarket product and then maintain its reputation by doing so?[26] The problem with such a commitment is that it ignores the profits to be earned from customers who already own equipment. As explained above, at any point in time the firm will balance the gain in profits from its locked-in customers against any loss in future profits. This will be true regardless of the degree of competition in the primary market.

If a firm's installed base increases relative to its expected future equipment sales, then the value of a reputation for low aftermarket prices declines and the incentive to raise aftermarket prices rises. If the prospects for future equipment sales begin to fade, then so do the future profits the firm expects on its equipment sales if it protects its reputation. Similarly, if the profit margin on future equipment sales is expected to be small due to increasing competition, then building and protecting a reputation is less likely to maximize profits. Given the time it takes to build a reputation, and the rapid rate of entry and exit among hightech firms, there may be little gain in future equipment profits as a result of building a reputation for low service pricing. Consider, for example, two recent defendants,

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[26]We continue to ignore information imperfections, so we assume that consumers can verify that a price is equal to its competitive level.

Wang and Prime Computer.[27] Due to hardware and software obsolescence, both experienced a rapid loss of sales for their proprietary minicomputers and eventually left the hardware manufacturing business. Preserving a reputation for low hardware service pricing was probably not worth much to these companies.[28]

If a firm does choose to build a reputation for low aftermarket prices, then each period of reputation-building is a period in which the firm forgoes profits from above-competitive service pricing to its incumbent equipment owners. The larger the base of customers who have already purchased the equipment, the larger the profit the firm forgoes when it builds or maintains a low-aftermarket-price reputation. A successful equipment firm faces an ever-increasing opportunity cost of maintaining its reputation for low aftermarket prices because a successful manufacturer will have a larger base of installed customers. Thus, even if consumers believed that the current low

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[27]Both Prime *(Virtual I* and *Virtual II, supra* note 2) and Wang (Systemcare v. Wang, 787 F. Supp. 179 (D. Colo. 1992)) were accused of exploiting their aftermarket power by tying hardware maintenance to proprietary software services and products.

[28]Joseph Kattan, *Marict Power in the Presence of an Installed Base,* 62 ANTITRUST L.J. I (1993) (emphasizing the fact that aftermarket power is strengthened when a firm's equipment manufacturing business is in decline).

aftermarket prices would continue forever, declining profits in the equipment market or a significant base of equipment owners would eventually induce the profit-maximizing firm to break with its commitment.

To better grasp the balancing between high aftermarket prices that reap profits from customers who have already purchased the equipment and low aftermarket prices that tend to increase future equipment sales, consider what would happen if a manufacturer had a very high discount rate, *e.g.*, if it faced an extremely high interest rate. In that case, future profits would be much less valuable than current profits, so the firm would be more inclined to charge high aftermarket prices and earn high profits from current owners of its equipment, even at the cost of reputation and future sales. A reputation strategy of lower aftermarket prices would reduce the present value of future profits: although it would generate higher future sales, the discounted value of each future sale would be lower than the value of a current sale. In the extreme case of a firm that totally discounts future profits, it would maximize its current period profits by selling aftermarket products at full monopoly prices.

The effect of a high discount rate is similar to that of a declining market: future profits have less effect on current decisions. If the number of equipment buyers were

declining by 50 percent every period, the firm would have a greater incentive to charge high aftermarket prices than if the equipment market were growing. In a growing market, the reputation value would be greater relative to the profits that could be earned by exploiting incumbent equipment owners.

The effect of growth rates may be why so many of the aftermarket antitrust cases have been against firms with declining markets for the original equipment. Many defendants argue that their low profits demonstrate they could not be exercising aftermarket power. This conclusion does not follow. In fact, a firm with low or negative equipment profits has a relatively greater incentive to raise aftermarket prices above the competitive level.[29] If a firm is likely to be exiting the industry soon, then it will want to earn the maximum profits possible from selling aftermarket products to the remaining owners of its equipment.

While a declining market or declining equipment profits enhance the incentive to raise aftermarket price, the incentive is still present in a stable market. Even if equipment demand is expected to remain constant, profits in the future are of less value due to discounting. Only if ex-

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[29]Corporate and industry documents repeatedly show an increasing emphasis on raising service profitability are the same time that equipment profit margins are declining.

pected profits from equipment are growing at a faster rate than the discount rate will a firm have the incentive to price the aftermarket product at (or below) the competitive level. While such rapid growth does occur at times, it is generally short-lived and is then followed by a period of slowly growing or declining equipment sales. If slower growth or declines in sales are forecast in the near future, then the incentive to raise aftermarket prices is likely to be present even if current growth is quite rapid. Still, this points out that the current and anticipated future growth rate of the market is relevant information in analyzing the incentive for a firm to exercise market power in a proprietary aftermarket.

D. SWITCHING COSTS AND INFORMATION

There are two avenues through which a manufacturer's anticompetitive aftermarket practices can reduce its future profits: by reducing sales to new customers and by losing incumbent owners of the manufactures's equipment when they replace or upgrade equipment. Imperfect consumer information, such as about the price of aftermarket products, is more likely to affect the sensitivity of new customers to aftermarket practices. Switching costs—which include training users, rewriting custom software, translating archival company data to new formats, etc.—affect the choices of incumbent equipment users.

First consider existing customers. They tend to be well informed about the market, so their willingness to switch to another brand depends on the magnitude of their switching costs. If switching costs are high, manufacturers have some room to raise their aftermarket prices or impose other onerous conditions (such as ties) without substantially reducing future profits when their incumbent equipment owners replace or upgrade equipment. This is so because the customer weighs the gain from switching to a manufacturer with lower equipment or aftermarket prices against the cost of switching. The lower the cost of aftermarket policies relative to switching costs, the fewer customers the firm will lose due to high aftermarket prices.

Even if there were no costs to adapting to a new brand, such as software and data format conversion or retraining, high aftermarket prices would be rational. The manufacturer's aftermarket policies can create an opportunity cost of switching by lowering the market value of a customer's used equipment.[30] A customer that switches

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[30]The purchase of aftermarket products for use in conjunction with the equipment is only relevant if the used equipment has a positive market value. It does not make sense, for example, to purchase service for a used machine unless the serviced machine will yield profits greater than the cost of service; such a machine would have a positive market value (that is, the firm is better off keeping—and servicing—the equipment than throwing it away).

when the salvage value of its equipment is positive pays the net cost of the new brand of equipment less the used value of its old equipment. If the manufacturer raises aftermarket prices (or imposes other restrictive policies), the value of used equipment will fall correspondingly, because the purchaser of used equipment will have to pay the higher aftermarket prices. Thus, for example, a $2,000 increase in the present value of lifetime service costs will reduce used equipment prices by $2,000 and thus will raise the cost of switching to another brand by $2,000: the owner bears the cost of the aftermarket policy whether it keeps its equipment or sells it to someone else. Thus, the equipment owner is unable to avoid the costs of supracompetitive aftermarket pricing, and the possibility of switching to another equipment brand does not solve the problem, as defendants argue.

Now consider the effect of aftermarket policies on new customers. Obviously, their sensitivity to aftermarket policies depends on the extent to which they are aware of them. Most of the cases involve high-technology products in rapidly evolving industries. Much of the incumbent customer base initially purchased their equipment before aftermarket policies were firm or reputations established. New suppliers and technological alternatives are constantly emerging. Customers may not be able to uncover the structure of aftermarket prices and policies for the many

manufacturers and independent aftermarket providers — much less accurately forecast prices and policies over the lifetime of the durable equipment.[31] As explained above, even if customers are fully aware of a manufacturer's anticompetitive aftermarket policies, the manufacturer will find it profitable to charge above-cost aftermarket prices. Further, the less well informed new customers are about aftermarket policies, the less those policies will affect customer demand, and the higher will be the firm's optimal aftermarket prices. In this sense, the *Kodak* majority was right to emphasize information imperfections: the greater the imperfections and the higher the cost of obtaining information, the greater the manufacturer's incentive to exploit aftermarket power. The ability to exercise market power in the first place, however, does not depend on information imperfections.

E. SUMMARY

Even under the most favorable assumptions—perfect competition in the equipment market and perfect information on the part of consumers—firms have the ability and

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[31] We emphasize the importance of information about a wide variety of policies, many of which are less transparent than prices. Manufacturers can exert their market power in many ways other than merely raising prices, such as tying maintenance to software upgrades, parts, diagnostic software, or equipment upgrades. All of these and others have alleged in pending cases.

incentive to price aftermarket products above cost. While a reputation for low-cost aftermarket products has some value, that value is limited: at every point in time, firms balance the gain in future profits from reputation-building against the cost in foregone current profits on customers who already own equipment. Thus, reputation effects will not result in competitive prices for proprietary aftermarket products. Imperfections in the operation of the equipment market such as imperfect consumer information about aftermarket policies or costs that incumbent equipment users bear if they switch brands, increaSe the extent to which aftermarket price will be above cost, but supracompetitive aftermarket prices Will Occur even if the equipment market has no such imperfections.

II. CONSUMER HARM FROM ANTICOMPETITIVE AFTERMARKET POLICIES

Some commentators have argued that even if aftermarket prices are supracompetitive, equipment market competition leads to offsetting low equipment prices, and thus the overall "system" price is set competitively.[32] Obviously, this argument is only relevant to potential new customers, since customers who already own equipment are

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[32]*See, e.g.*, Shapiro & Teece, *supra* note 23; Carl Shapiro, *Aftermarkets and Consumer Welfare: Making Sense of* Kodak, *infra this issue*, 63 ANTITRUST L.J. 483 (1995).

not compensated for aftermarket price increases through the lower equipment prices. More generally, however, the claim is also incorrect for potential new customers. The claim that consumers are unharmed because the overall price is unchanged is true only in the extreme case in which equipment and service are used in fixed proportions. In practice, the high aftermarket price will reduce the amount of use, and therefore value, that consumers will get out of the product.

For a true system—which has a fixed combination of components, including aftermarket products—the price of individual components is unimportant.[33] However, it is rarely the case that aftermarket products are used in fixed proportions with equipment. Consider computer maintenance service: customers will purchase different contracts, or no contracts, depending on the prices. For example, some customers will purchase a contract for 9-to-5 service on weekdays; others will purchase "24-by-7" service; yet others will purchase service on a time and materials basis. Different consumers will make different numbers of copies on copiers and thus will use different amounts of toner. Firms

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[33]If the aftermarket products and equipment are used in fixed proportions, that is, if one machine is used with a fixed quantity of the aftermarket products, then the combination is truly a "system." If the system price is determined by perfect competition in the equipment market, then the separate price for each component is unimportant and there is no meaningful aftermarket economic power.

will differ in the number of terminals hooked to a mini-computer and therefore will demand different quantities of peripherals.

When aftermarket products are used in variable proportions with equipment, high aftermarket prices create a consumer loss regardless of the price of equipment. Consider photocopiers and their toner cartridges: if toner is priced above the competitive level, copier market competition may force manufacturers to lower copier prices to offset the supracompetitive toner profits. However, users will make fewer copies because the incremental per copy cost is higher. Given that the copier has been purchased, making fewer copies is a distortion to efficient use of the equipment. If the copier market is competitive and profits are always driven to zero, then producers will see no change in profits; the gain in profits from a higher aftermarket price will be competed away through a lower equipment price. Consumers bear the entire inefficiency as a reduction in the value of copiers. Thus, higher aftermarket prices, regardless of the price of equipment, directly harm consumers in one of the ways that monopoly behavior in general harms consumers: high prices lead to inefficiently low use of the product or service. The deadweight loss from pricing the aftermarket good above marginal cost is borne entirely by consumers.

This is illustrated in Figure 1, which shows a consumer's demand for the aftermarket product given that the consumer owns the equipment. Pricing the aftermarket product above marginal cost lowers the consumer's surplus in the aftermarket by area A plus area B. Area A is profits to the manufacturer, so in a competitive market the price of the equipment is forced down by A and firms still break even. Area B, however, is surplus lost to both consumers and producers. Competition does not force down equipment prices by this additional amount, yet it is a reduction of consumer surplus from the amount the consumer would obtain if equipment were priced at marginal cost.

Figure 1. Area B is "deadweight loss": consumer loss in aftermarket that is not compensated by price reduction in equipment market.

Higher aftermarket prices cause another particularly costly distortion that is often overlooked. The customer's decision on how long to keep an old machine repaired and running before replacing it with a new one is influenced by supracompetitive service prices.[34] If service prices are high, then equipment will be abandoned earlier than it would have been if service prices were competitive. The importance of this phenomenon has been demonstrated in some of the cases by evidence that manufacturers introduce price increases for parts and service on old equipment—or refuse to service old models altogether—specifically to induce customers to migrate to a newer model. These policies pre-supposed substantial customer switching costs, since the manufacturers assumed that enough customers would upgrade to the same equipment brand, rather than switching brands, to make it worthwhile to lose parts and maintenance sales on the already installed older equipment.

Of course, charging high prices is not in itself illegal. In the absence of barriers to entry, however, economic profits in the aftermarket should induce entry into

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[34]In this case the variability in proportions comes both in the form of the amount of service applied per year to the equipment, as well as the number of years service is applied.

the market.[35] Manufacturers may exclude aftermarket providers with lower costs, different service qualities, or different product variety to protect their profits, all of which create consumer harm. Such exclusion is especially likely in dynamic industries with rapidly developing technologies, as discussed below. The resulting loss of consumer welfare can be substantial, potentially much greater than the loss from a monopolist that simply sets price above its marginal costs.

Some economists have argued that it is in the manufacturer's interest to subcontract production of aftermarket products and services to others who have lower costs, thereby collecting the return on the intellectual property embodied in the aftermarket products, while at the same time increasing the value of its equipment to consumers by lowering costs and increasing quality or variety in the provision of aftermarket products. In practice, however, firms with proprietary control over aftermarkets will rarely want to subcontract to alternative producers. One problem is the firm's inability to write contracts with

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[35]If the product is proprietary, for example, computer software, then barriers to entry do exist. However, there are generally other aftermarkets that are not proprietary, for example, hardware maintenance. It has been alleged that equipment manufacturers react to entry in the nonproprietary aftermarkets with tie-ins to the proprietary product, thus harming competition in the nonproprietary aftermarket.

those subcontractors that would prevent the subcontractors from going into business for themselves in competition with the manufacturer after receiving the necessary training and experience to enter the market.[36]

Another problem with subcontracted aftermarket production is that the independence of a third-party aftermarket provider may offer consumers benefits that a subcontractor is unable to offer or that the manufacturer does not want to offer. For example, an independent maintenance provider may advise a customer on alternative brands of equipment to replace or upgrade old equipment, thereby lowering brand-switching costs by improving information.

If manufacturers could commit to competitive service market entry before they began selling equipment, they would do so: as discussed above, a credible commitment to low service prices is to everyone's advantage. However, firms only want to commit before they have an installed base. Once they have an installed base, they prefer to have a monopoly in the aftermarket. Since there is generally not enough aftermarket business to support

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[36]The seriousness of this problem is obvious in most of the aftermarket cases: independent aftermarket service companies are nearly always founded by former service employees of the manufacturer.

independent service and parts companies until after a large installed base exists, the opportunity to create viable independent aftermarket competition does not arise until after the time when the manufacturer prefers monopoly control.

Consumers might also gain from having access to a variety of aftermarket quality choices. While some consumers may be willing to pay a higher price to obtain higher quality service, others prefer lower quality service in exchange for a lower price. However, it is probably not credible for the manufacturer to offer both "high-quality" and "low-quality" service under a single brand name. Independent providers may be necessary to obtain the optimal variety in an aftermarket.[37]

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[37]Defendants often claim that only the manufacturer should provide service to prevent costly "fingerprinting," i.e., disagreements about whether the equipment manufacturer or the independent aftermarket provider is responsible for a problem. The problem with this defense is that it justifies a manufacturer that offers a low priced bundle of equipment plus aftermarket service as a choice to consumers, but it does not justify excluding rivals and forcing customers to accept such bundling without choice. Indeed, the Supreme Court said customers should be allowed "to make their own choice on these matters of quality". Aspen Skiing Co. v. Aspen Highlands Skiing Corp, 472 U.S 585, 610 (1985).

Thus, even if firms lower the equipment price while raising aftermarket prices, consumers are still harmed in a variety of ways. Consumers receive less value from their equipment, do not obtain possible cost reductions, and have fewer choices over variety and quality than is optimal.

III. CONTRACTUAL SOLUTIONS TO AFTERMARKET MARKET POWER

Several economists argue that consumers can protect themselves from anticompetitive aftermarket policies by writing contracts. Benjamin Klein has argued that although "holdups" of locked-in customers are sometimes possible, if customers are generally aware of the possibility they will take contractual actions to protect themselves before entering an agreement to make the original purchase.[38] To avoid anticompetitive aftermarket exploitation, however, consumers would need to write completely contingent contracts at the time they purchase equipment that would specify all aftermarket prices and policies in the future. Such perfect long-term contracts are generally not possible for a variety of reasons: equipment lives are long, the future is uncertain (especially for high-technology durable products like micrographic, computing, and telecommunications

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[38]Benjamin Klein, *Market Power in Antitrust: Economic Analysis After* Kodak, 3 Sup. Ct. Econ. Rev. 43 (1993).

switching equipment), and there are many aftermarket policies the firm could use to raise profits as an alternative to a previously contracted price.[39] These problems remain whether or not the consumer can foresee the potential for policy changes.

One commonly used policy is tying of aftermarket products. In *Kodak* and many similar cases a proprietary aftermarket product was used to tie other products or services, which allegedly yielded supracompetitive returns by leveraging the firm's market power in one market into another market. That is, the manufacturer had a monopoly in a proprietary product (such as operating software), but faced competition in another aftermarket (such a hardware maintenance). To reduce competition in the maintenance market, the manufacturer could allow purchase of operating software only if the consumer also purchases hardware maintenance. Thus, monopoly power in software is extended to the maintenance market. Due to the multiplicity of possible restrictive policies and the great

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[39]For example, as in most of the cases cited above, the manufacturer could tie one product to another, *see supra* notes 1-5. Manufacturers might also reduce the training or quality of service technicians on locked-in accounts; charge above-cost prices for aftermarket products and services associated with equipment upgrades; use lower quality replacement parts; reduce the amount of preventative maintenance; release engineering fixes as priced upgrades rather than as zero-cost field change orders, etc

uncertainty about future costs and technological developments in high-technology industries, it is very difficult if not impossible to write effective contracts at the time of equipment purchase that prevent such practices.

As an example, consider Klein's proposal that a "most favored customer" clause will yield an efficient market outcome. He argues that customers need not anticipate all contingencies, because they can protect themselves against ex post holdups by a contractual provision that guarantees they will receive the same terms as the most favored customer.[40] To the contrary, however, all customers may be treated identically and may have complete information about current and future prices, yet firms will still rationally charge above-cost aftermarket prices.[41]

To be fully protected, customers must be able to write contracts not only on variables such as price and performance terms, but also on the extent to which the firm permits or even encourages entry into the aftermarket by future competitors. In general, it will not be possible to

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[40]Klein, *supra* note 38, at 51.

[41]In practice, providing aftermarket services to customers of different sizes, in different locations, and with different needs will involve different costs and different customized terms. The complexity induced by the multiple dimensions of aftermarket services may render simple, uniform contractual protection infeasible.

write contracts between a customer and a manufacturer that ensures the manufacturer will permit or encourage the entry of lower-cost, quality enhancing rivals. Thus, it is unreason-able to expect that enforceable contracts can be written that protect customers completely.

The "contractual protection" view suffers from an excessive reliance on theory. Contracting cannot rule out the possibility of inefficient outcomes in aftermarkets; its probability of success depends in any particular case on the relevant facts. A case-by-case factual analysis of contractual protection will be needed to determine whether they have protected, or can protect, consumers from market power in a particular aftermarket.

IV. VIRTUAL MAINTENANCE V. PRIME COMPUTER

While the Supreme Court decision in *Kodak* has set the framework for the relevant analysis, *Kodak* only concerns summary judgment. As Justice Blackmun made clear, "Kodak's arguments may prove to be correct."[42] In a closely related case, *Virtual Maintenance v. Prime Computer,* a jury unanimously found that Prime Computer

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[42] 112 S. Ct. at 33.

violated Section 1 of the Sherman Act.[43] The Sixth Circuit reversed the decision, concluding that the aftermarket theories presented to the jury were erroneous as a matter of law.[44] The Supreme Court granted certiorari and remanded the case to the Sixth Circuit for reconsideration in light of the *Kodak* decision.[45] In its second opinion the Sixth Circuit concluded that the theory of potential aftermarket power was correct as a matter of law, and that the facts supported the theory.[46]

Virtual is an important case because the alleged abuse of aftermarket power received a full hearing on the facts. Prime was a company that manufactured mini-computers with a proprietary architecture, known as Series 50 machines. In the aftermarkets, Prime offered Series 50 maintenance contracts and software support contracts that

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[43]No. 89-CV-71762-DT (E.D. Mich. 1990). One of the authors of this article, Jeffrey MacKie-Mason, testified as an expert witness on behalf of Virtual. The facts provided in this section are offered to illustrate the theoretical points made elsewhere in this article; it is not the authors' intent to re-try *Prime* or convince the reader that we have made a fully balanced presentation of the facts. Where factual assertions are not cited, they can be found in the district court trial testimony; the court did not enter its own findings of fact.

[44]957 F.2d 1318 (6th Cir. 1992)

[45]113 S.Ct. 314 (1992).

[46]995 F.2d 1324, 1330 (6th Cir. 1993).

included upgrades to various proprietary software products. Virtual Maintenance is an independent company that wanted to compete for hardware maintenance of Series 50 mini-computers. *Virtual* found that Prime required customers to purchase hardware maintenance from Prime if they wanted to obtain essential software upgrades and support. As a result, Virtual was unable to sign maintenance customers.

Due to its geographic location and prior customer relationships, *Virtual* was particularly interested in customers who used their Prime computers to run a design program called PDGS. PDGS is owned by Ford Motor Company, which requires its outside design contractors to use it. However, PDGS ran only on Prime minicomputers, and Prime had the exclusive right from Ford to license PDGS and to set prices and terms. Ford released one or two PDGS upgrades each year that designers were required to obtain. Prime provided upgrades for about $12,000 per year (per copy) to customers who also purchased Prime hardware maintenance. Otherwise, customers would have to pay about $100,000 per copy annually for PDGS software upgrades.

The case illustrates the three main points of this article: Prime was able profitably to exploit its aftermarket power over locked-in customers despite competition in the marker for equipment sales; consumers were harmed by the

exclusion of aftermarket competition in terms of both price and product choice; and ex ante contracting was not sufficient to avoid the aftermarket problem.[47]

A. AFTERMARKET POWER IN *VIRTUAL*

Virtual alleged that Prime was illegally tying hardware maintenance to software upgrades and support. Prime had proprietary control over crucial software products, including the only operating system software that ran on Prime minicomputers and Ford's design software, PDGS. Customers who already owned Prime computers needed to obtain software upgrades and support or the value of their substantial investment in hardware, custom software, training, data, and designs would be effectively lost. Thus, it seemed clear that Prime had economic power over the tying products (software upgrades and support), one element of an illegal tie. Further, Prime seemed to be in a position to use this power adversely to impact competition in the hardware maintenance market. Indeed, essentially 100 percent of the maintenance on Series 50 minicomputers in the United States was performed by Prime.

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[47]While this case illustrates many of our points, we want to emphasize that our results apply to a much broader, more general set of circumstances than those represented by the facts of this case.

Prime denied having economic power over locked-in customers for software. Prime argued that it could not raise hardware maintenance prices above competitive levels because doing so would be unprofitable overall: any profits gained on hardware maintenance would be less than those lost on equipment sales. Prime argued that equipment sales would be lost because the minicomputer market is quite competitive.[48] A tie without economic power is not an antitrust violation.

To address whether a firm has the potential profitably to raise prices above the competitive level, courts generally determine the relevant markets for analysis, then examine the firm's share of that market, the overall concentration of the market, and the effect of the firm's actions on competition in the market. Defendants usually argue for a broad market definition and then point out their small market share, while plaintiffs suggest narrower markets in which the defendant has a high share.

In *Virtual* there were two aftermarkets alleged by the plaintiff: upgrades and support for Prime proprietary software (the tying product market) and Series 50 hardware

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[48]The plaintiff did not contest the fact that the minicomputer market is competitive. Prime claimed to have only a 3% share of a worldwide market for computer systems. Memorandum in Support of Prime's Motion for Summary Judgment at 3, *Virtual*.

maintenance (the tied product market).[49] *Virtual* asserted that these markets were separate from one another and separate from the original equipment market. Thus, the tie that Prime imposed allowed supracompetitive pricing in the hardware maintenance market, which harmed consumers. Prime responded that these aftermarkets were too narrow to be usefully considered as markets due to competition in the market for new equipment sales, and thus that the correctly defined market was the market for computer systems.

Prime's defense ignored the incentive that it had to exploit incumbent customers who were locked-in to its equipment. There was never much doubt that customers who already owned Series 50 equipment were locked-in to Prime, particularly those who had already licensed PDGS and were doing design work for Ford. Series 50 minicomputers were priced from $100,000 to $500,000. The initial PDGS license was about $120,000 per machine, and several designers had ten or more licenses. In addition, design customers had invested years in training users and developing valuable contractual relationships and experience

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[49]It was demonstrated in trial that Prime imposed its tying conditions on all of its proprietary software products. There were over 100 of such products, including the operating system software that every customer needed to use its minicomputer. However, the appeals court restricted its consideration to the tie imposed on PDGS, and thus considered only market definitions limited to upgrades and support for design software and Ford-required design software. 995 F.2d at 1328.

with Ford. Non-PDGS customers often had invested in developing custom software that could run only on the Series 50. Indeed, at trial, a Ford manager who was testifying as a witness for Prime stated that if Ford had to switch quickly to a different brand of computer it would be forced out of the car business.

In its first opinion, the Sixth Circuit did not recognize that with such a large, locked-in base of installed customers, Prime would face a balancing between profits on aftermarket products and profits on new equipment sales. The court placed all of the emphasis on the competition for equipment sales:

> A customer's initial purchase of a particular manufacturer's product does not justify a limited market definition. Defining the market by customer demand *after* the customer has chosen a single supplier fails to take into account that the supplier ... must compete with other similar suppliers to be designated the sole source in the first place.[50]

Based on this reasoning, the Sixth Circuit panel reversed the jury verdict. After the Supreme Court's *Kodak* decision, however, the Sixth Circuit reversed itself, noting that high

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[50] *Id.*

switching costs created a group of locked-in customers over whom it might be profitable to exercise market power even if the market for new equipment sales were competitive. The court found that users were locked in by their prior investments in hardware, training, and software development, and that "Prime is able to exercise control over the sale of software support because of its exclusive distribution license from Ford, and Ford's requirement that its automotive design suppliers use the most current version of Prime's software support."[51] The Court concluded that the proffered aftermarket was appropriate because there was a potential that exploiting those customers would be profitable for Prime.

Consistent with our earlier discussion of incentives to raise aftermarket prices, it emerged at trial in this case that aftermarket services and products were responsible for an increasing fraction of Prime's revenues and profits. The large installed customer base relative to potential new sales moved the balance between aftermarket and new equipment profits in favor of significant aftermarket exploitation.[52]

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[51] *Id.* at 1330.

[52] Indeed, about two years after the trial, Prime changed its name to Computervision and halted all equipment manufacturing. However, at trial there was never any discussion of Prime as a declining company, or indication that Prime might be exploiting its aftermarket customers because it expected to be leaving the equipment business. Indeed,

B. HARM TO CONSUMERS

The factual record in *Virtual* provided evidence that consumers were harmed by the tie, both via effectively higher aftermarket prices and lack of a high-quality alternative. Software upgrade prices were 900 percent higher if not purchased through the tie, whereas if customers purchased hardware maintenance from Prime to get the lower tied price on software upgrades, they had to pay about 20 percent more than the maintenance prices offered by Virtual.[53] Furthermore, customers testified that they preferred Virtual's service but for the tie, and thus felt forced.[54]

As explained above, when a manufacturer excludes competition from an aftermarket, the harm to customers

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Prime repeatedly stated in its briefs before the district and appeals courts that it would not exploit aftermarket customers because to do so would affect its many years of expected future equipment sales. See, e.g., Memorandum in Support of Prime's Motion for Summary Judgment at 3, *Virtual;* Reply Brief of Defendant-Appellant Prime Computer, Inc. at 13, *Virtual.*

[53]957 F.2d at 1322.

[54]*Cf.* Jefferson Parish Hosp. Dist. No. 2 v. Hyde, 466 U.S. 2, 12 (1984) (defining the ability to force the buyer to purchase an unwanted tied product as the "essential characteristic" of illegal tying arrangements)

may extend beyond high mark-ups. In particular, the manufacturer may limit the variety of products available, in terms of both quality and product characteristics. That appears to have been the case in *Virtual*. Virtual offered more flexible hours and days of coverage than Prime, allowing each client to negotiate customized terms. Virtual offered to provide more extensive preventative maintenance. Extensive evidence was presented that customers believed Virtual provided higher quality service than Prime (based on Virtual's prior service of non-Prime equipment). In addition, Virtual developed and promoted a disaster recovery service to differentiate itself from Prime.

Prime's exclusion of Virtual harmed customers in another way, as well. All PDGS users had Lundy graphics terminals attached to their Prime minicomputers. Virtual already maintained more than 50 percent of the Lundy terminals in the region. AS Prime's witnesses argued at trial, many customers might prefer to have a single provider of hardware maintenance for their computers and peripherals in order to reduce fingerprinting and increase the efficiency of service provision. Excluding Virtual from the Prime Series 50 maintenance market denies customers the opportunity to obtain one-stop hardware maintenance from

a preferred vendor.[55]

C. WAS CONTRACTUAL PROTECTION A VIABLE ALTERNATIVE?

The possibility that customers could have protected themselves from aftermarket exploitation through fully contingent contracts signed at the time of the initial equipment purchase was not examined at trial.[56] However, some of Prime's other policies illustrate the difficulty of contractual protection for a complex, multidimensional product like computer maintenance.

From time to time, Prime would develop revisions to the microcode that controlled the fundamental operations of the computer.[57] Such revisions might fix a malfunction or improve functionality. Customers often view obtaining the latest microcode revisions as essential to efficient or correct operation of their equipment. For many years, Prime made microcode revisions available to all

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[55]Within a year of trial, Virtual had contracts to maintain slightly more than 50% of the Series 50 computers running PDGS that had been formerly maintained by Prime.

[56]The longest maintenance contract offered by Prime was for 3 years.

[57]Microcode runs at a more primitive level than an operating system; users do not usually interact with microcode directly.

Series 50 customers for the cost of the media (about $15). Customers could perform the simple installation task. Overnight delivery was available. However, around the time of
Virtual's attempted entry, Prime changed the policy: customers with Prime maintenance would continue to receive the revisions as part of their maintenance contract. Nonmaintenance customers now had to pay $2500, send in the board from their computer on which the microcode was to be installed, and wait up to thirty days for the board to bc returned. Of course, in most cases a computer cannot function at all when one of its boards is missing.

Prime similarly changed its board repair policy at about the same time. For some time, if a single board component failed, a customer could receive an exchange board by overnight delivery, and Prime would repair the original board for a modest charge. Under the new policy, similar to the microcode policy, nonmaintenance customers had to mail in the board for repair without receiving an exchange, pay a minimum $2000 board repair fee, and wait up to thirty days for the repair.

Prime's variety of policies illustrates the complexity that would be required in any contract that attempted to impose ex ante, long-term restrictions on a firm's ability to exploit aftermarket power. When a firm has legitimate eco-

nomic power due to proprietary control of software or hardware design, for example, there are numerous and subtle ways in which that power can be extended to other markets.

D. SUMMARY

The *Virtual* record was never completed. In its second opinion, the Sixth Circuit remanded to the district court for a new trial because of a judicial error. This decision was on appeal to the Supreme Court when the parties settled. However, the Sixth Circuit concluded that sufficient evidence was presented at trial to support the claim that Prime could and did profitably exert economic power over an aftermarket, despite competition in the market for new equipment. Consumers were harmed not only through higher aftermarket prices, but also through a reduction in the variety of product characteristics and quality that was available. Finally, the complexity of the aftermarket service and maintenance products, as seen in the many dimensions through which Prime could impose anti-competitive policies, is consistent with our argument that completely contingent ex ante contracts are not a feasible mechanism for eliminating the exercise of aftermarket market power.

V. IMPLICATIONS FOR ANTITRUST POLICY AND PRACTICE

We have shown that competition in the equipment market does not discipline aftermarket prices, that consumers are harmed by the lack of aftermarket competition, and that contracts cannot necessarily protect consumers. Since harm to the consumer caused by reduced output, exclusion of cost-reducing competition, and restrictions on product variety and quality are specifically the concerns of antitrust law, there appears to be a role for antitrust policy. Applying antitrust proscriptions to aftermarket practices such as tying and the foreclosure of competition can have procompetitive effects. If contracts and reputation are insufficient, a clear antitrust rule might provide an alternative commitment mechanism that moves pricing and other practices closer to their efficient, competitive ideal in both primary markets and aftermarkets. While we would not assert that all aftermarket strategies such as tying reduce competition or that all such strategies harm consumers, the theoretical and practical possibilities of these harmful outcomes make it prudent to consider each case on its individual merits.

Past cases have emphasized the degree of competition and the availability of information as determinants of the rationality of anticompetitive behavior in aftermarkets. In fact, anticompetitive behavior in aftermarkets

will occur even with perfect competition and perfect information in the primary markets. Attention should be focused instead on the factors that determine the relative size of current profits to future profits. Our analysis highlights the following questions as relevant to the existence and magnitude of anticompetitive behavior:[58]

- How important are current aftermarket profits relative to future equipment and aftermarket profits? The more important are current aftermarket profits, the less that reputation effects will moderate current aftermarket power. For example, is the market growing or declining? Does the firm have a short-term technological advantage, after which the business will become "commoditized" and profits reduced? Are systems evolving away from proprietary towards open architectures, thus reducing the extent to which future customers will be locked in?

- What is the magnitude of switching costs? The more "locked in" customers are, the higher are potential profits from raising price in the aftermarket.

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[58]*See also* Borenstein, MacKie-Mason & Netz, *supra* note 13; Kattan, *supra* note 28.

- How sensitive is aftermarket demand to changes in price and other terms? Sensitivity to terms determines the degree of consumer loss from aftermarket market power.

- How important are long-term reputations for favorable aftermarket practices in the industry? Do firms tend to introduce unfavorable policy changes after the market has matured? Is there rapid entry and exit by industry participants? How complete is information on the terms and costs of aftermarket services?

- How difficult is it for customers to write long-term contracts with equipment manufacturers that provide protection against aftermarket price increases and other policy changes? How many dimensions must be considered in protecting against future service and product policies?

These are some of the questions that need to be addressed in an economic analysis of alleged exercise aftermarket power. The answers will determine the trade-off firms face between current and future profits, and thus determine the degree to which firms will exercise market power in the aftermarket and the resulting impact on consumers.

APPENDIX G

LAW REVIEW ARTICLE:

AFTERMARKETS AND CONSUMER WELFARE:
MAKING SENSE OF *KODAK*

CARL SHAPIRO
1995

AFTERMARKETS AND CONSUMER WELFARE: MAKING SENSE OF *KODAK*

CARL SHAPIRO*

I. INTRODUCTION

The Supreme Court, in *Eastman Kodak Co. v. Image Technical Services, Inc.*,[1] ruled that a manufacturer could, as a matter of law, have monopoly power in the servicing of its own equipment, even if it had no such power in the sale of that equipment. In other words, aftermarkets could be relevant antitrust markets, even if equipment markets are competitive. The Court thus concluded that Kodak's refusal to sell its proprietary spare parts to independent service organizations (ISOs) could, at least in theory, allow Kodak to control the aftermarket for the servicing of Kodak

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* Transamerica Professor of Business Strategy and Professor of Business and Economics, Haas School of Business and the Department of Economics, University of California at Berkeley. This article was prepared for the FTC/DOJ/ABA/CULC conference, Post-Chicago Economics: New Theories—New Cases?, Washington, D.C., May 26-27, 1994. I would like to thank Severin Borenstein, Joseph Farrell, Richard Gilbert, Thomas Jorde, Joseph Kattan, Janusz Ordover, Donn Pickett, David-Teece, Daniel Wall, and Robert Willig for discussions that helped improve the analysis presented here. I would also like to thank the National Science Foundation for financial support.

[1] 112 S. Ct. 2072 (1992).

equipment, thereby using its control over Kodak *parts* to gain control over the *servicing* of Kodak machines.

The *Kodak* decision has already received an enormous amount of attention, both by economists and by lawyers, and rightly so.[2] To the economist, *Kodak* raises fascinating and thorny issues, both theoretical and practical.[3] For the antitrust lawyer, the reach of the *Kodak*

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[2] *See, e.g.*, Joseph Kattan, *Market Power in the Presence of an Installed Base*, 62 ANTITRUST L.J. 1 (1993); Carl Shapiro & David Teece, *Systems Competition and Aftermarkets: An Economic Analysis of* Kodak, 39 ANTITRUST BULL. 135 (1994); Benjamin Klein, *Market Power in Antitrust: Economic Analysis After* Kodak, 3 SUP. CT. ECON. REV. 43 (1993) Severin Borenstein, Jeffrey MacKie-Mason & Janet Netz, Exercising Market Power in Proprietary Aftermarkets (unpublished manuscript 1994). These are but a few of the many articles in legal and economic journals that explore the *Kodak* decision and its implications. I do not even attempt here to delve into the various legal cases that cite *Kodak* or involve aftermarkets.

[3] I certainly have found *Kodak* to touch on many important and difficult economic issues. Some of these I explored in my article with David Teece, *supra* note 2. This article complements that article. There we focused on the question of assessing market power in aftermarkets, and we explained how the economics literature informs that task. Here I offer a step-by-step framework organizing the economic analysis of antitrust claims involving aftermarkets. I also report new research here suggesting that monopolization of aftermarkets in the presence of equipment competition is likely to cause far less consumer injury than traditional monopoly power. Finally, I argue that the *Kodak* decision may end up having a more chilling effect on certain business practices than appeared likely even a year ago.

decision is great indeed, as it markedly expands the number of companies that may be regarded as "monopolists."

Kodak has also been put forward as the preeminent example of so called "Post-Chicago Economics."[4] If "Post-Chicago Economics" stands for the notion that markets are subject to numerous imperfections, as indeed the Court recognized in *Kodak*, let me be counted in the "Post-Chicago" camp. However, if "Post-Chicago Economics" stands for the notion that courts are capable of fine-tuning firms' behavior in competitive markets, or that antitrust should move away from promoting efficiency and consumer welfare,[5] count me out. In what follows, I will show that *Kodak* holds considerable dangers of restraining the behavior of firms that possess no genuine monopoly power.

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[4]Steven Salop linked the *Kodak* decision with a "Post-Chicago" movement, in *Kodak* as Post-Chicago Law and Economics (Jan. 1993) (unpublished manuscript). The *Kodak* decision was a focus of the conference on "Post-Chicago Economics," of which this article was a part.

[5]See Eleanor Fox, Eastman Kodak Company v. Image Technical Services, Inc.--*Information Failure as Soul or Hook?* 62 ANTITRUST L.J. 759 (1994), for a discussion of the view that the information failures discussed by the majority in *Kodak* were in fact a pretense, the Court being more interested in protecting worthy small businesses than in promoting efficiency as such. "*Kodak* is essentially a case about abusing competitors; it is not essentially a case about lack of consumer information." *Id.* at 767.

The Court's decision in *Kodak* has directed the attention of the antitrust community towards certain economic issues of long-standing interest to economists. One reason *Kodak* has attracted so much attention is that the Court incorporated in its opinion economic thinking of the past fifteen years in a way not often seen before. Let me cite three examples.

First, the Court discussed the economics of reputation, exploring whether a firm would find it profitable to run down its reputation by taking advantage of some of its more vulnerable customers, i.e., by engaging in installed-base opportunism.[6] Second, the Court explored the issue of consumer switching costs, took explicit notice that some customers might be "locked in" to certain products, and recognized that sophisticated contracts could to some degree protect these consumers from being gouged.[7] Third, the Court recognized that market boundaries may be strongly affected by compatibility, i.e., the ability of various

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[6]Some of the basic trade-offs involved in the economics of reputation are discussed in Carl Shapiro, *Premiums for High-Quality Products as Returns to Reputation,* 98 Q.J. ECON. 659 (1983).

[7]There is a long literature on contracts, opportunism, and lock-in, associated most prominently with Oliver Williamson. *See, e.g.,* OLIVER WILLIAMSON, THE ECONOMIC INSTITUTIONS OF CAPITALISM (1985); *see also* Joseph Farrell & Carl Shapiro, *Optimal Contracts with Lock-In,* 79 AM. ECON. REV. 51 (1989).

components to work together.[8] Aftermarket problems are most likely to arise with incompatible components, giving rise to proprietary aftermarkets.

In this article, I offer a systematic economic framework for analyzing antitrust cases involving aftermarkets. This framework is quite powerful, both for understanding the arguments that arise in aftermarket cases, and for identifying the questions that must be asked to define markets and evaluate competitive effects of various business practices when proprietary aftermarkets are involved. My framework is structured around the four available theories of antitrust injury involving aftermarket practices. All in all, I conclude that significant or long-lived consumer injury based on monopolized aftermarkets is likely to be rare, especially if equipment markets are competitive.

I also present here a new, in-depth analysis suggesting that any consumer injury arising when a single firm controls its own proprietary aftermarkets is likely to be small, even if one accepts the theories put forward by those

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[8]Economists have paid close attention lately to the economics of compatibility, and specifically to the *network externalities* that arise when many consumers use compatible components. *See, e.g.*, Michael Katz & Carl Shapiro, *Systems Competition and Network Effects,* 8 J. ECON. PERSP. 93 (1994); Stanley Besen & Joseph Farrell, *Choosing How to Compete: Strategies and Tactics in Standardization,* 8J. ECON. PERSP. 117 (1994).

concerned about aftermarket power. The reason is that equipment market competition will tend to "rebate" any aftermarket overcharges to buyers in the form of equipment discounts. This general idea is well-known, but I develop a formal model in the Appendix to this article, making it possible to quantify this concept.

Finally, I report here on some recent consumer class actions spawned by the *Kodak* decision. It seems that the *Kodak* decision will successfully be used by plaintiffs in many antitrust actions, at least to obtain class certification, even if the theories put forward by these plaintiffs bear no resemblance to, or even contradict, the theories endorsed by the Supreme Court in *Kodak*. I also make some remarks about remedies in *Kodak*-style cases.

II. An Economic Framework For Studying Aftermarkets

Very often, consumers make investments in capital equipment that requires maintenance, repair, upgrades, and other complementary products and services. Kodak's customers buy high-volume copiers, for which they require suitable replacement parts and service by technicians capable of repairing Kodak brand copiers. This pattern is common for sophisticated equipment, as well as for

hardware/software systems. For example, a consumer buying a Nintendo video game machine subsequently seeks to buy game cartridges compatible with the Nintendo machine, and a customer familiar with Microsoft's Word for Windows will find it easier to learn an upgrade to Word rather than learning a whole new word processing program. In all of these cases, a consumer, having chosen a specific brand at one point in time, may find it costly to switch later to other brands. That is the essence of an aftermarket.

There are three key elements to an aftermarket: (1) the consumer purchases several (complementary) components that work together as a "system" to provide value to the customer; (2) these components are purchased at different points in time; and (3) there is some degree of "lock-in" or sunk costs, i.e., at least some of the expenditures on the initial component(s) cannot be recovered if the consumer later switches brands. In the case of high-volume copiers, the initial component is the machine itself, and the components purchased later are spare parts and service to keep that machine operating properly.[9]

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[9]I discuss below the possibility that consumers may choose to purchase more than one component at the outset, thereby shifting some purchases from aftermarkets into the overall systems market.

In this article, following the Court, I will refer to the primary market as the "equipment market," leaving spare parts, service, or repair as the aftermarkets. But the foremarket/aftermarket pattern is far more general than this. It includes computer hardware and software, any situation where consumers buy one piece of equipment and then consumables for that equipment (a common situation for medical equipment), or even one piece of equipment (or one copy of a computer program) and then later more of the same equipment (e.g., after the customers has learned to use that equipment or program). Suffice it to say that aftermarkets are ubiquitous.

Since aftermarkets are so widespread, and involve a substantial volume of commerce, it is not surprising that the *Kodak* decision has spawned a large number of cases. Indeed, we are in the midst of a wave of cases encouraged and inspired by *Kodak*. These involve such industries as high-volume copiers and printers, medical equipment, operating systems for sophisticated manufacturing facilities, minicomputers, and telecommunications equipment. Some of the larger monetary claims involve class actions brought on the behalf of customers buying equipment from companies that are alleged to have monopolized proprietary aftermarkets for the servicing of their equipment, or upgrades to that equipment. Some of these cases, while

citing *Kodak*, have strayed very far inclecd from the theories put forward by the Supreme Court in *Kodak*.

Economics currently offers four theories of aftermarket power:

(1) *The "Surprise" Theory.* The equipment manufacturer can engage in ex post exploitation of locked-in buyers, also called installed-based opportunism, by making unexpected changes in aftermarket policies that exclude aftermarket rivals and thus allow the manufacturer to extract more money from locked-in buyers who have already purchased its equipment.

(2) *The "Costly Information" Theory.* There are a large number of myopic or poorly informed buyers who fail to account for aftermarket costs when purchasing equipment. Since these equipment buyers are not frightened away by monopolistic aftermarket prices, equipment competition creates little or no incentive for manufacturers to offer service at competitive prices. To the contrary, manufacturers have every incentive to extract the greatest profits possible from their installed base. In other words, costly information severs or at least weakens the link between aftermarkets and equipment markets, permitting a firm in a competitive equipment market to have aftermarket power.

(3) *The "Limited Manufacturer Commitment" Theory.*[10] The equipment manufacturer has limited ability, at the time a customer buys equipment, to make credible and binding price and quality commitments for aftermarket service. As a result, the manufacturer inevitably takes advantage of customers in the aftermarket, at least to some degree, if not prevented from doing so by aftermarket competition. Thus, aftermarket competition provides added protection for consumers, even if equipment markets are highly competitive.

(4) *The "Price Discrimination" Theory.* A firm with market power in the systems market, i.e., the overall inter-brand market for equipment and service together, can price discriminate more effectively in the sale of its system if it can separately control the prices of parts and service for its equipment. Exclusion of aftermarket rivals therefore can be profitable by permitting such enhanced price discrimination

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[10]The "Limited Manufacturer Commitment" Theory is emphasized by Severin Borenstein, Jeffrey MacKie-Mason & Janet Netz, *Antitrust Policy in Aftermarkets, supra* this issue, 63 ANTITRUST L.J. 455 (1995). As I explain below, this theory has essentially the same implications for consumers as does the Costly Information Theory. I include the "Limited Manufacturer Commitment" Theory here partly for the sake of clarity, to show how my analysis relates to that of Borenstein, MacKie-Mason, and Netz, and partly because the formal model developed in the Appendix relates specifically to the issue of consumer injury with competitive equipment markets and monopolized aftermarkets.

by the manufacturer.[11]

I analyze each of these four theories in turn.

A. The "Surprise" Theory

The surprise theory starts from the assumption that buyers in the aftermarket are vulnerable, and asks whether the equipment manufacturer will find it profitable to unexpectedly change its policies so as to exploit them. The firm that takes advantage of its installed base of customers who find it costly to switch to other brands is said to engage in installed-base opportunism.

It should be noted from the outset that any consumer injury associated with the surprise theory will tend to be short-lived, typically confined to the cohort of consumers who owned equipment when the manufacturer made its policies more restrictive or somehow less favorable to customers or aftermarket rivals. Under the surprise theory, antitrust injury would occur if buyers had anticipated or relied on competitive aftermarkets, but some change in the

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[11]Unlike the previous three theories, the "price discrimination" theory does not apply to a firm operating in a competitive equipment market. However, it could apply, in weakened form, to a firm with some market power in the equipment market even if that market power falls short of true monopoly power.

manufacturers' policies blocked that competition.[12]

1. Contractual Protections and Installed-Base Opportunism

Buyers have strong incentives to obtain contractual protections when purchasing their equipment, precisely to prevent the manufacturer from exploiting them later in a proprietary aftermarket. These protections may take a number of forms:

(1) Warranty Coverage. By obtaining warranty coverage, the buyer contracts for some service when the equipment is purchased, prior to any lock-in.

(2) Rental or Lease of Equipment. By renting or leasing equipment, again the "system" (equipment, replacement parts, and service) is bundled, and the buyer avoids having to negotiate with the seller from a position of weakness.

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[12]A variation not involving any "surprise" occurs if buyers had expected to pay supracompetitive aftermarket prices, and the manufacturer changed its policies to prevent unanticipated aftermarket competition from taking hold. In this case, buyers might indeed have benefited from aftermarket competition, but even in the absence of that competition they would pay no more than competitive prices for their equipment and service together.

(3) Long-Term Service Contracts: Buyers frequently obtain long-term service contracts concurrently with equipment; this is the norm in the high-volume copier market in which Kodak participates. Again, parts and service purchases are moved out of the aftermarket and into the foremarket, where the buyer has more choices.

(4) Nondiscrimination Clauses. A buyer can gain some protection by obtaining a contractual commitment from the seller that the buyer will receive the same terms and conditions for aftermarket services as are offered to new customers.

(5) Second Sourcing and Open Systems. A buyer can gain substantial protection if the manufacturer makes a commitment to support or at least allow independent sources of aftermarket services to develop, or if the manufacturer agrees to adhere to certain industry standards, ensuring that the manufacturer will not be the only source of proprietary parts or upgrades.

Warranty coverage, rental and lease arrangements, and long-term service contracts all serve the function of shifting buyers' purchases from the aftermarket to the systems market. Thus, they diminish the importance of the aftermarket and any scope for consumer injury from aftermarket practices and policies. Nondiscrimination

clauses, second sourcing provisions, and commitments to open systems all reduce the manufacturer's ability to engage in installed-base opportunism. However, it must be recognized that these contractual protections typically do not entirely eliminate the possibility of installed-base opportunism, since it is quite difficult for buyers to obtain ironclad protection by writing a "complete" contract that specifies all relevant aftermarket terms and conditions.

Any analysis of installed-base opportunism must account for any explicit contractual protections obtained by customers. If most customers are so protected, any antitrust injury will be limited to a minority of consumers.

2. The Surprise Theory and the Economics of Reputation

Even if buyers are well informed, they can still be exploited in the aftermarket if they lack the explicit contractual protections mentioned above. No doubt some customers are vulnerable to such exploitation, at least for the short term. The Court correctly identified some of the factors that would influence a firm's decision to exploit its installed base of customers.

Whether a manufacturer finds it profitable to engage in such installedbased opportunism is a classic problem in the economics of reputation: Can the manufacturer earn

greater profits by preserving its reputation for serving its customers well or by running down its reputation by exploiting its installed base?[13]

Economics has much to say about installed-base opportunism. First, a manufacturer's ability to exploit any given customer cannot exceed (in present-value terms) that customer's brand-switching costs, i.e., the extra cost that consumer would incur in replacing its system with a rival vendor's system.[14] Brand-switching costs vary across buyers, and with the age and vintage of their equipment, so a firm attempting to charge "monopoly" prices in its own aftermarkets will inevitably face some elasticity of demand as customers with relatively low switching costs will indeed switch brands in response to higher aftermarket charges.

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[13]*See* Shapiro, *supra* note 6.

[14]The mere fact that a customer has purchased a piece of capital equipment does *not* in and of itself imply that the brand-switching costs are large. If the used-equipment market functions well, and if the buyer has made no investments in complementary assets, the brand-switching costs may be low. The buyer simply sells the old equipment and replaces it with another brand of equipment. However, transactions costs in used-equipment markets can be high, due in part to asymmetric information about the condition of used equipment (the famous "lemons" adverse selection problem, which partially accounts for the fact that nearly new equipment often sells for far less than brand-new equipment) and in part to the fact that used-equipment markets may be thin.

A manufacturer will find installed-base opportunism less attractive, the greater is the growth rate of the market, the greater are its prospects to gain market share, the greater is the margin on its overall system, and the stronger are the linkages between current aftermarket policies and future equipment sales. Installed-base opportunism is most likely to be attractive for a firm that is exiting the market, or in a sharply declining market.[15] The damage to a manufacturer's reputation associated with installed-base opportunism need not be limited to the product in question. If a firm's actions undermine customers' trust in the firm, or alter customers' expectations about how the firm will behave in the future, there is nothing confining the harm to the firm's reputation to a single product market. Would you be happy going to a mechanic who was known to overcharge for truck repairs, merely because you have a car, not a truck, in need of repair?

In practice, the key question at trial may not be whether the manufacturer could have gained by engaging in installed-base opportunism, as calculated based on market growth rates or profits margins. A simpler question may be

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[15]It is not a coincidence that several aftermarket cases involve the declining minicomputer market. Virtual Maintenance, Inc. v. Prime Computer, Inc., 957 F.2d 1318 (6th Cir.), *vacated,* 113 S. Ct. 314 (1992); HyPoint Technology, Inc. v. Hewlett-Packard Co., 949 F.2d 374 (6th Cir. 1991).

more important: Did or did not the manufacturer in fact change its policies in a way adverse to locked-in customers and aftermarket rivals? If so, did the manufacturer in fact raise any of its aftermarket prices at the same time or soon thereafter, or did policy changes reasonably serve a legitimate business purpose?

3. Will the Kodak *Decision Protect Buyers from Installed-Base Opportunism?*

Suppose that the market conditions make installed-base opportunism both possible and profitable. To illustrate, suppose that the market is declining, the firm sells no other comparable equipment where its reputation may suffer, the firm in question truly controls a key aftermarket input (such as spare parts), and many customers lack explicit contractual protections. Even in this situation, it is far from clear that an antitrust duty to sell spare parts to independent service organizations will do much to protect consumers, if indeed the manufacturer wants to engage in opportunism. After all, there is nothing to prevent the manufacturer from simply raising the price of the parts it controls, whether or not it sells those parts to independent service organizations. Raising parts prices to monopoly levels is a straightforward way to engage in installed-based opportunism, without risking antitrust exposure, if that is the manufacturer's intent.

The important point here is that installed-base opportunism and exclusion of ISOs can easily be decoupled: exclusion is not necessary to exploit the installed base, nor does it imply that the firm is engaging in opportunism. In fact, the manufacturer controlling spare parts can positively benefit from the entry of more efficient service providers, whether or not it is engaging in installed-based opportunism, since it can capture its profits in the form of markups on its proprietary parts. This argument suggests that a refusal to deal may be motivated by other concerns, e.g., the manufacturer's concern about protecting its reputation.

Furthermore, imposing a duty to deal on the manufacturer might well harm consumers. Partial protections for buyers, based on antitrust law, may be worse than no protections at all, an admittedly surprising concept that Joseph Farrell and I have called the "Principle of Negative Protection."[16] Ultimately, interbrand competition, contractual protections, and manufacturer commitments, and

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[16]This finding has an intuitive basis. The point is this: If the antitrust laws force the manufacturer to act inefficiently in aftermarkets, ultimately consumers will have to pay for these inefficiencies, leading to consumer harm. *See* Joseph Farrell & Carl Shapiro, *supra* note *7; see also* Zhiqi Chen & Thomas Ross. *Refusals to Deal, Price Discrimination and Independent Service Organizations*, 2 J. ECON. & MGMT. STRATEGY 593 (finding a similar result, based on a reduction in product quality motivated by a legal duty to deal).

the manufacturer's reputation are likely to be far stronger forces protecting buyers than will be a legal duty to deal with its aftermarket rivals.

Finally, one might well ask what constitutes a "surprise," in the context of the Surprise Theory. Very often, firms implement policies in specific ways that could not have been foreseen either by them or by their customers. Is any change in policy or new implementation of policy that might adversely impact aftermarket rivals a "surprise," and subject to antitrust challenge, even for a firm in a competitive equipment market? Clearly, interbrand competition may be stifled and buyers may be hurt if manufacturers have little flexibility in setting and implementing their aftermarket policies. What constitutes a "change" in policy, and what is a reasonable adjustment to changing market conditions, remain to be determined.

Economics tells us that only under certain limited circumstances (discussed above) can manufacturers in competitive equipment markets profitably harm consumers by changing their policies with regard to the sale of replacement parts to independent service organizations, or by tying parts and service, in comparison with simply pricing their key replacement parts to maximize profits. This being the case, and since consumer injury under the Surprise Theory is naturally limited in time, it is fair to ask

whether consumers ultimately stand to benefit from the *Kodak* decision, even accepting the basic theoretical point that in some circumstances a manufacturer might make the highest profit by engaging in opportunistic behavior. One can also ask whether this type of consumer injury, which tends to be short-lived by its nature, is of the sort that requires treble damages protection, instead of the single damages available under contract law. After all, antitrust law is slow-working and a rather blunt instrument, while installed-base opportunism is by definition a short-run strategy.

B. THE "COSTLY INFORMATION" THEORY

The Costly Information Theory applies in equipment markets in which buyers are relatively poorly informed, especially as regards the aftermarket costs associated with various brands of equipment. Surely there are markets in which information about life-cycle costs is sufficiently costly that many buyers make their equipment purchases with poor information about aftermarket costs. Perhaps automobile markets fit this pattern. If most buyers are ignorant of aftermarket costs when buying equipment, it is true that equipment competition might do little to ensure that buyers receive competitive prices in aftermarkets. However, as I discuss below, equipment competition *still*

offers substantial protection for consumers, even if they are poorly informed or myopic.

1. *The Costly Information Theory and the Total Cost of Ownership (TCO)*

Before exploring the implications of poor buyer information, it should be recognized that the circumstances in which there is a significant market failure based on poor buyer information may not be all that common. Buyers have strong incentives to purchase equipment based upon the total cost of ownership of the equipment over its lifetime. The Costly Information Theory can only apply if the cost to buyers of obtaining TCO information is high relative to the savings available to informed buyers.

Information costs are lowered by: (1) third-party sources of information such as consultants, brokers, and publications; (2) buyers' ability to spread information costs over multiple units; (3) repeat buyers who have experience with life-cycle costs. In many situations where expensive equipment is being financed, the financing entity requires a pro forma life-cycle cost analysis for the piece of equipment prior to providing financing.

The Costly Information Theory is unlikely to apply for expensive equipment. Likewise, the Costly Information

Theory will be very difficult to sustain in markets where buyers are large and/or experienced. Indeed, it is ironic that in the market for high-volume copiers, in which Kodak competes, there is compelling evidence that most buyers do indeed make their purchase decisions based on the total cost of ownership.[17]

In any event, it is not necessary for all consumers to have good information in order for aftermarket prices to be disciplined by equipment competition. Poorly informed buyers may be protected by informed buyers, whose presence forces sellers to compete on a TCO basis and penalizes sellers with high aftermarket charges, especially since it may be difficult for sellers to identify the poorly informed buyers so as to price discriminate against them.

2. *Systems Competition in the Presence of Costly Information*

Even in the relatively rare case where the bulk of the buyers are poorly informed about life-cycle cost—e.g., if information costs are uniformly high relative to the cost of a system—systems competition will still tend to prevent

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[17] I have studied this market as an expert for Xerox and for Kodak. Indeed, in enduser class actions against both of these companies, the plaintiffs and their economic expert conceded that buyers typically purchased high-volume copiers on TCO basis.

manufacturers from earning monopoly profits. The key point is that sellers are surely aware of the life-cycle profits associated with selling a piece of equipment, even if buyers are poorly informed about aftermarket costs. Therefore, systems competition pushes manufacturers to discount their equipment to capture any aftermarket "monopoly" profits.[18]

This is a very compelling economic argument, and one that goes a long way toward showing that substantial ongoing consumer injury from exclusionary aftermarket policies is unlikely to occur in competitive equipment markets, even if consumer information is poor. The Court instructs us that the facts must be marshalled to show that equipment suppliers truly do consider the total return on a system when pricing equipment; I would expect this to be the typical case. The idea of giving away the razor to make money on sales of razor blades is just too obvious, and intuitive, for companies to miss it. Again there is irony here: Kodak (like Xerox) very clearly evaluates the total

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[18]This does not mean that equipment is sold below cost. It merely means that the rate of return earned on equipment sales is below a competitive level, while the rate of return earned on aftermarket sales is above the competitive level, so that the suppliers overall earn a competitive rate of return. Of course, to the extent that equipment and service are sold together, as when equipment is leased and the lease includes service, one cannot even define these separate rates of return and there is no aftermarket transaction to begin with.

return on the sale of a high volume copier, including anticipated aftermarket revenues, when selling its copiers. Any company that does not account for aftermarket revenues and costs when selling its equipment should be seriously questioned by its shareholders, quite apart from any antitrust exposure.

3. *Consumer Injury from Costly Information Tends to Be Limited*

This powerful observation naturally leads to the following question: How do consumers fare if aftermarket prices are supracompetitive and equipment prices are subcompetitive?[19] Under this outcome, the suppliers who sell their equipment in a competitive market earn only competitive rates of return overall on equipment and service. There are no monopoly profits in this situation, and consumer injury is limited to the inefficiency (economic deadweight loss) caused when prices depart from costs on a component-by-component basis. Consumer injury in this context consists only of a "deadweight-loss triangle." Unlike traditional cases, consumer injury in aftermarkets does not include any "monopoly profits rectangle" (which usually represents the monopoly overcharges and forms the

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[19] Again, prices cannot even be defined for equipment and distinct from aftermarket service in situations where consumers purchase equipment and service together.

basis of customer injury claims in monopolization cases) because that rectangle is "rebated" to consumers in the form of equipment discounting.

So, if the Costly Information Theory applies, the injury against which the antitrust laws are protecting consumers is quite different from the usual monopoly overcharges, and certainly does not appear in the form of monopoly profits. The injury is entirely due to "inefficient substitution" as consumers substitute relatively inexpensive equipment for relatively expensive service in assembling a system. This involves consumers replacing their equipment prematurely, both because the equipment is discounted below a competitive level and because service is priced supracompetitively (and older machines require more service). In the following section, I offer a detailed formal model showing that this type of consumer injury should generally be far less of a concern than traditional monopoly power.

Furthermore, manufacturers in a competitive equipment market have incentives to avoid even this inefficiency by providing information to consumers. A manufacturer could capture profits by raising its equipment prices above market levels (i.e., closer to cost), lowering its aftermarket prices below market levels (i.e., closer to cost), and informing buyers that its overall systems price is at or

below market. In this fashion, the manufacturer could eliminate some or all of the deadweight loss, attract consumers by offering a lower total cost of ownership, and still capture as profits some of the eliminated deadweight loss. In other words, and unlike traditional monopoly power, the manufacturers have a direct incentive to eliminate even the small inefficiency caused by poor consumer information.

C. The "Limited Manufacturer Commitment" Theory

The Limited Manufacturer Commitment Theory is developed in some detail in the article by Borenstein, MacKie-Mason, and Netz.[20] The basic idea is that manufacturers cannot commit to competitive aftermarket prices, due to imperfections in the contracting process, and thus will inevitably be tempted to raise aftermarket prices at least somewhat above competitive levels to take advantage of locked-in customers.

It is important to distinguish the Limited Manufacturer Commitment Theory from the Surprise Theory. The Limited Manufacturer Commitment Theory applies on an ongoing basis; it is a steady-state theory, not a theory based on transition. Aftermarket prices are fully

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[20]Borenstein et al., *supra* note 10.

anticipated by buyers; there is no surprise. Manufacturers balance the short-run gain from setting high aftermarket prices against the need to offer somewhat lower equipment prices in the future to continue to attract new customers. As Borenstein, MacKie-Mason, and Netz correctly point out, since he reputation mechanism does not work perfectly,[21] outcome is for aftermarket prices to be somewhat above competitive levels, and equipment prices to be somewhat below competitive levels.[22]

1. *Nimble Antitrust Law vs. Contractual Remedy*

I find this a difficult theory on which to hang antitrust policy. The essential policy assumption is that manufacturers are unable to make commitments to their customers regarding aftermarket terms and conditions, but that antitrust law can remedy this market failure. I have some trouble accepting the view that the antitrust laws can effectively provide protections for consumers where manufacturers cannot through contract. Antitrust law is not

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[21]See Carl Shapiro, *Consumer Information, Product Quality, and Seller Reputation,* 13 BELL J. ECON. 20 (1982), for a general demonstration that the reputation mechanism is an imperfect substitute for contractual protections.

[22]The size of the gap between aftermarket prices and costs depends on the factors discussed earlier, such as the growth rate of the market, interest rates, etc.

a nimble policy instrument for fine-tuning relationships between manufacturers and customers in ways that contracts cannot.

What precisely is antitrust law supposed to do that private contracts cannot? The answer must be "ensure competitive aftermarkets. " However, manufacturers clearly can make such commitments, at least in the general terms that antitrust law might guarantee. A manufacturer can promise for some period of time not to change certain of its policies, such as its policy to sell replacement parts to ISOs on the same terms as they are sold to final customers. Or a manufacturer can promise to support open systems or second sources for service or software upgrades. Protections like these are sought by some customers and offered by some sellers in the real world. Of course, contractual remedies are not perfect, but they are certainly workable and far more flexible than antitrust law. Ultimately, antitrust law seems a poor instrument to try to correct for the fact that contracts are imperfect.

As noted above, the Limited Manufacturer Commitment Theory implies that each manufacturer has the incentive to try to offer stronger commitments to customers than do other firms, and thus eliminate the deadweight loss, gain market share, and raise profits. In fact, competition should favor those manufacturers that can design more

effective contracts, or that have a greater reputation to put on the line (because they sell more products or are especially well regarded), further reducing any remaining inefficiency from contractual and reputational imperfections. Are we to believe that such a manufacturer positively needs the antitrust laws to make those commitments?

2. *Second-Order Antitrust Law*

Leaving aside these major issues, let me turn to a direct evaluation of the harm to consumers that can arise when equipment markets are competitive and aftermarkets are monopolized. For the purposes of assessing consumer welfare, the Limited Manufacturer Commitment Theory is nearly identical to the Costly Information Theory: in either case, consumers face supracompetitive aftermarket prices and subcompetitive equipment prices.[23]

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[23]In fact, the Limited Manufacturer Commitment Theory predicts significantly smaller consumer injury than does the Costly Information Theory. Under the Limited Manufacturer Commitment Theory, aftermarket prices are well below monopoly levels, if somewhat higher than competitive levels, because the reputation mechanism keeps aftermarket prices down, albeit not all the way down to competitive levels. In contrast, under the Costly Information Theory (at least its strong form), aftermarket prices are at "monopoly" levels, i.e, the level that a firm would set without regard to any future equipment sales.

As noted above, consumer injury in this situation is confined to the deadweight loss/inefficiency caused by the departure of equipment and service prices from costs on a component-by-component basis. As explained by Borenstein, MacKie-Mason, and Netz, this inefficiency is largely due to the premature replacement of equipment by customers.

I am not convinced that this type of consumer injury is worthy of the attention of the antitrust laws. This injury tends to be far smaller than traditional monopoly overcharges and deadweight losses. I am skeptical that good antitrust policy requires the courts to be involved in regulating the conduct of businesses unless significant consumer injury or inefficiency is involved.

I have developed a rather detailed formal economic model to show that consumer injury from monopolized aftermarkets, in competitive equipment markets, tends to be far smaller than the consumer injury associated with traditional monopoly overcharges. The analysis, which is presented in the Appendix to this article, shows that, even if one takes models such as that offered by Borenstein, MacKie-Mason, and Netz on their own terms, including their assumption that firms cannot make commitments to aftermarket terms and conditions when equipment is sold, it is far from clear that monopoly control of proprietary

aftermarkets is a problem worthy of antitrust attention, at least as measured by potential consumer injury.

More specifically, in the Appendix I calculate what I call the "Injury Ratio," as follows. Consider the impact on consumers of a price increase for aftermarket services. Ignoring equipment competition, suppose this price increase would harm consumers by $100. Suppose that accounting for equipment competition (i.e., accounting for the fact that higher aftermarket prices would lead to lower equipment prices), the overall injury to consumers is only $25. Then I would say that the Injury Ratio is 25 percent. The Injury Ratio is a measure of how much less we should worry about aftermarket monopoly, compared with traditional monopoly power, if we adopt a consumer-welfare viewpoint.

In the Appendix to this article, I show that the Injury Ratio is approximately zero if aftermarket prices are close to cost before they are increased. In the specific example shown at the end of the Appendix, if aftermarket prices are 5 percent above cost, the Injury Ratio is 7.5 percent, i.e., 92.5 percent of the aftermarket overcharges associated with further increases in aftermarket prices are rebated to consumers in the form of equipment discounts. Under the Limited Manufacturer Commitment Theory, aftermarket prices are held somewhat close to cost by

reputation effects, making this result very significant. Even taken on its own terms, this theory does not lead to significant consumer injury.

More generally, equation (9) in the Appendix provides a (complex) formula for the Injury Ratio. If aftermarket prices are 10 percent above cost, in my example I find that the Injury Ratio is about 14 percent, so 86 percent of the potential aftermarket injury is alleviated through equipment competition. Even under the Costly Information Theory, therefore, any consumer injury associated with monopoly aftermarket prices is substantially mitigated by equipment competition.

D. The Price Discrimination Theory

The observation that a firm with market power selling several complementary products can earn greater profits if it controls all of those products (components of the system) rather than just one is well known and applies not only to aftermarkets, but also if all the components are sold at once. Control of all the components-permits greater price discrimination. However, this theory applies only to a firm with market power in the equipment market, since a firm with no equipment power has no substantial ability to

price discriminate.[24]

My concern here is again whether there is substantial, predictable consumer injury that can be avoided by application of the antitrust laws to aftermarket practices. Suppose that a manufacturer indeed can discriminate more effectively by controlling the servicing of its equipment as well as the supply of replacement parts. What is the impact on customers?

The manufacturer's control over the service aftermarket does not give the manufacturer "more" market power. After all, the ISOs still must, by assumption, purchase their parts (or some other key input) from the manufacturer. That input, and the original equipment itself, is the basic source of market power, and the firm's market power ultimately depends upon the attractiveness of substitute systems, i.e., on the ability of independent entities

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[24]To be more precise, traditional thinking in industrial organization economics is that a firm in a competitive market cannot engage in price discrimination. It does appear, however, that even firms with limited market power (i.e., firms that face less than perfectly elastic demand for their product but fall far short of being monopolists) can and do engage in price discrimination. The degree of price discrimination in markets with competitive structures remains a puzzle for economists. *See, e.g.*, Severin Borenstein & Nancy Rose, *Competition and Price Dispersion in the U.S. Airline Industry*, 102 J. POL. ECON. 653 (1994).

to assemble an entire system (equipment, parts, and service) to compete with the manufacturer in question.

Instead of augmenting the manufacturer's market power, control over the service aftermarket arguably widens the scope for price discrimination. The impact of excluding aftermarket rivals thus involves a comparison of two regimes of price discrimination: (1) the perfectly legal regime in which parts are used as a metering device to discriminate among different types of customers (along with other discrimination devices, such as quantity discounts); and (2) the possibly illegal regime in which additional methods of price discrimination are possible by virtue of the exclusion of independent service organizations (e.g., discrimination based on response time, charging more for customers who can least tolerate downtime and thus will pay extra to have their equipment fixed very quickly).

Economic theory provides no general guidance as to whether price discrimination increases or decreases overall efficiency, consumer surplus, or total output. Generally, a manufacturer's ability to engage in additional forms of price discrimination can enhance or detract from overall efficiency. Furthermore, added price discrimination can benefit or harm consumers in the aggregate. Certainly it tends to benefit some customers and harm others, although identification of the winners and losers from particular

forms of price discrimination is both tricky and fact-intensive. If parts and service are used in the same fixed proportions by all buyers, controlling service provides the manufacturer with no additional ability to price discriminate, and thus has no impact on consumers.

The main point here is simple: the impact on consumers of preventing certain forms of price discrimination is unclear (consumers can win or lose), and unlikely to be highly beneficial. We are not talking here about a comparison between monopoly prices and competitive prices. We are talking about a comparison between one scheme of price discrimination by a firm with equipment market power and another scheme of price discrimination. An antitrust policy designed to impose one scheme of price discrimination instead of another is very unlikely to be a major source of consumer benefits.

From a practical, litigation standpoint, the Price Discrimination Theory appears to provide plaintiffs with a method of elevating a firm that lacks monopoly power in the equipment market, but may still have some ability to engage in price discrimination (e.g., a firm with 40 percent of the equipment market) into a firm with monopoly power in its proprietary aftermarket. Given the ambiguous implications of price discrimination for efficiency and for

consumer surplus, it is far from clear that this additional legal route will ultimately benefit consumers.

E. End-User Class Actions Involving Aftermarkets

The original *Kodak* case was brought by Kodak's aftermarket competitors, i.e., independent service organizations. Following the Supreme Court's ruling in *Kodak*, customers, i.e., end-users of equipment, have also brought claims in the form of class actions, alleging that they were injured by manufacturers' exclusionary aftermarket policies. The enduser damage claims in these class actions can dwarf the lost-profits damage claims in ISO lawsuits, as evidenced by the end-user class action brought against Xerox[25] and Xerox's settlement of that class action, as well as a more recent end-user class action against Kodak itself.[26] Class actions involving aftermarket claims have the prospect of being brought in a wide range of industries.[27]

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[25]R&D Business Systems v. Xerox Corp., No. 2-92-CV-042 (E.D. Tex. Feb. 23, 1993).

[26]Kopies, Inc. v. Eastmen Kodak Co., No. C94-0524-BAC (N.D. Cal. Jan. 1994).

[27]*See, e.g.*, Telecom Tech. Servs., Inc. v. Rolm Co., Civil Action No. 9-94-CV-145 (E.D. Tex. 1994) (a class action against a manufacturer of telecommunications equipment (PBX systems)).

Consider the problem faced by the lawyers seeking to launch an antitrust class action against a firm in a competitive equipment market. What end-user class is consistent with the available theories?

(1) The Surprise Theory only involves damages to customers who owned equipment at the time of a policy change, not to those purchasing in full awareness of the defendant's aftermarket policies. Logically, therefore, any class of end users would be confined to one cohort of customers, which itself can run into problems with the four-year statute of limitations. Damages are further confined to those customers who left themselves open to installed-base opportunism, not even all customers in the cohort. For example, a customer who leased equipment rather than bought it received the benefits of systems competition; it is hard to see how such a customer should be in the end-user class.

(2) The Costly Information Theory applies only if customers are unable to evaluate equipment on a life-cycle basis, which is difficult to argue if the equipment is expensive and the buyers are businesses. Should the class consist of only those buyers who were unable to intelligently purchase equipment based on the total cost of ownership? In any event, as I noted above, damages are

markedly reduced once one accounts for the discounting of equipment in anticipation of aftermarket markups.

(3) The Limited Manufacturer Commitment Theory requires that contractual remedies were highly imperfect, which can be difficult to sustain when many customers sign long-term contracts, or obtain extended warranties, when they purchase their equipment. Like the Costly Information Theory, it suffers from the fact that end-user damages are greatly attenuated by equipment competition, as indicated by the "Injury Ratio" calculations given above.

The Kodak class action is instructive as regards the dangers now facing firms in competitive equipment markets as they fashion their aftermarket policies.[28] In the Kodak class action, plaintiffs' lawyers relied on the Price Discrimination Theory, perhaps because of the limitations associated with the other theories just noted.[29] This required them to argue that Kodak had market power in the

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[28]Professor Janusz Ordover of New York University and I served as experts for Kodak in the class certification process.

[29]In particular, plaintiffs did not rely on the Surprise Theory. Their challenge to Kodak's refusal to sell parts to ISOs appeared to have nothing to do with the fact that Kodak allegedly altered its parts policies in 1985, a point the Supreme Court emphasized, but merely on the refusal to deal itself. This suggests that even manufacturers that have in place long-standing policies may be vulnerable if they have high market shares in their own proprietary aftermarkets.

equipment market, despite Kodak's modest share of the high-volume copier market, and despite the fact that plaintiffs in the original *Image Technical Services v. Eastman Kodak Company* case had conceded that Kodak lacked equipment market power.

Furthermore, the very essence of the Price Discrimination Theory is that the manufacturer can engage in additional price discrimination by excluding ISOs from the service aftermarket. Therefore, the impact on consumers is highly uneven. Depending upon whether a particular consumer was favored or disfavored under the two regimes, that end user may gain or lose from the additional discrimination. This hardly sounds like suitable material for a class action, in which all members of the class are allegedly injured by the challenged practice.[30] Nonetheless, a class consisting of all of Kodak's high-volume copier customers was recently certified based on this theory. It would appear that many manufacturers in competitive equipment markets are vulnerable to class actions of this type.[31]

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[30]See Herbert Hovenkamp, *Tying Arrangements and Class Actions,* 36 VAND. L. REV. 213 (1983), for further discussion along these lines.

[31]It is too soon to see if these class actions will prevail on the merits. Based on the *Xerox* and *Kodak* cases, however, it does appear that plaintiffs have a good chance of getting these classes certified and perhaps winning a settlement.

III. Remedies In Refusal To Deal Cases

Another problem with *Kodak-style* cases is the fashioning of a remedy. If the manufacturer must make parts available to ISOs, or must license its diagnostic software to them, what are reasonable rates to sell parts and license the software? To an economist, a refusal to deal is equivalent to an infinite price: the manufacturer simply will not sell its parts to ISOs. If such sales are required, the manufacturer will typically have an incentive to set a price that includes the opportunity cost of lost service revenues. Indeed, with this pricing the manufacturer welcomes entry by efficient ISOs.[32]

Do the courts intend to oversee the prices charged by manufacturers to ISOs for replacement parts? This seems unlikely, given the understandable historical aversion of the courts to regulating the prices set by businesses. Nor would a rule requiring manufacturers to sell parts to ISOs on the same terms as these parts are sold to end users prevent the manufacturer from charging the profit-maximizing price for parts, which properly includes the opportunity cost of lost

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[32]This relates to one of the business justification arguments for a refusal to deal: the manufacturer can always extract profits in the form of parts prices, and a refusal to deal suggests another motive, such as protecting the manufacturer's brand name from being damaged by poor 190 service, e.g., through false attribution.

service margins when equipment is serviced by third parties, including self-service customers.

IV. CONCLUSIONS

What is the state of economic thinking regarding Kodak and aftermarkets? For firms in competitive equipment markets, two theories of antitrust liability—the Costly Information Theory and the Limited Manufacturer Commitment Theory—appear to apply only in relatively limited circumstances. And even where these theories apply, they imply sharply limited consumer injury, as shown by my "Injury Ratio" calculations and the model provided in the Appendix.

Another theory the Surprise Theory—has limited applicability and is explicitly short-run in nature. In any event, a manufacturer who chooses to engage in installed-base opportunism can do so without adopting policies to exclude aftermarket rivals, simply by raising the price of the aftermarket input controlled by the manufacturer, be it replacement parts, diagnostic software, or something else.

All this leaves us with a real question of whether consumers stand to gain much, even if firms generally make

their parts available to ISOs.[33] After all, manufacturers can and will include in their parts prices an opportunity-cost component reflecting lost service revenues when ISOs buy parts and capture service business away from the manufacturer using those parts. In addition, imposing a duty to deal may limit the value of legitimate intellectual property (Xerox had patents on many of its proprietary parts, for example, and many firms have copyrighted diagnostic software that they may feel they must license to independent service organizations) and thus stifle innovation. Further problems can arise if competitive firms are not permitted to flexibly alter their aftermarket policies for fear of antitrust liability, just as problems arise if firms m competitive markets cannot modify their distribution methods for fear of antitrust exposure.

A fourth theory of liability—the Price Discrimination Theory—applies to manufacturers with some ability to engage in price discrimination, although they may well not have monopoly power. On its own terms, this theory generally implies that some buyers benefit from the exclusionary practices and others are harmed, so

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[33]I do not discuss here the legitimate business reasons for manufacturers restricting the sale of parts to ISOs. To the extent that firms are forced to sell parts by the antitrust laws, despite these legitimate concerns, consumers will be positively harmed by antitrust policy.

any net consumer harm may be small, and indeed price discrimination may well promote efficiency and raise consumer welfare. The Price Discrimination Theory, combined with the *Kodak* decision, seems to be primarily a method by which a firm with some ability to engage in price discrimination, e.g., a firm with 40 percent of the equipment market, becomes subject to antitrust scrutiny because it is deemed to have monopoly power (e.g., a 90 percent share or more) in its proprietary aftermarkets. I am not convinced that this extension of the reach of the antitrust laws is wise.

Many commentators criticized the *Kodak* decision precisely because it appeared to open the door to questionable antitrust actions, even though the Court was theoretically correct about the possibility of genuine aftermarket power. One has to wonder how deeply the Court thought about the trade-offs in summary judgment standards: Is the risk greater from inviting lawsuits that have little merit, or in prohibiting those few lawsuits in which aftermarket power is of genuine concern? To date, the critics' fears seem to have been borne out, despite the fact that plaintiffs have yet to win any final judgements in "parts cases" based on market power in proprietary aftermarkets.

There is genuine irony in all of this. Above all else, the *Kodak* decision stands for the notion that economic theories alone are not sufficient to determine antitrust cases; the courts must explore the facts. Is it not odd, therefore, that plaintiffs are now able to invoke the Court's theories from *Kodak* about costly information and consumer switching costs to bring antitrust actions, including massive class actions, and to obtain sizable settlements, even if the facts in these cases do not nearly conform to the pattern that the Court said might possibly arise and raise genuine antitrust concerns?

APPENDIX

Impact On Consumers of Equipment Competition and Aftermarket Monoploy

1. *Objective and Overview*

This appendix provides the formal model and calculations underlying my statements in the text regarding consumer injury with a competitive equipment market and monopolized brand-specific aftermarkets. To reiterate, the main point of this modeling effort is to show that consumer injury associated with supracompetitive aftermarket prices tends to be far less than the consumer injury usually associated with monopoly power. The reason is that, with competitive equipment markets, any supracompetitive aftermarket profits are effectively rebated to consumers in the form of discounts on equipment. With foremarket competition and aftermarket monopoly, the seller does not earn profits for the overall system. Therefore, consumer injury is confined to the inefficiency ("deadweight loss") created because equipment prices and aftermarket prices depart from costs. The primary inefficiency arises because the supracompetitive aftermarket prices, combined with the equipment discounts, induce consumers to replace

equipment more frequently than would be efficient.[1]

To measure this inefficiency requires a model with the following features: (1) consumers choose when to replace their equipment, and they shorten the replacement cycle when aftermarket prices are at supracompetitive levels; (2) sellers compete in the equipment market, discounting equipment in anticipation of receiving supra-competitive aftermarket prices. Using this model, one can calculate the injury suffered by consumers when after-markets are monopolized, but equipment markets are competitive. As shown below, this injury tends to be far less than the consumer injury that would arise if aftermarket prices were set at the same supracompetitive levels without equipment competition causing the monopoly profits to be "rebated" to consumers.

2. *How Buyers Choose When to Replace Equipment*

Consider then the following model of foremarket and aftermarket competition. Each piece of equipment costs K to manufacture, and each unit of "service" costs c for the manufacturer to provide. I am not distinguishing here between the various components of service (such as

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[1]This idea nicely developed in Severin Borenstein, Jeffrey MacKie-Mason & Janet Netz, *Antitrust Policy in Aftermarkets, supra* this issue, 63 ANTITRUST L.J. 455 (1995).

replacement parts and service technician labor). Instead, I simply model a composite "maintenance and repair" function, which I call "service," which may be supplied competitively or may be monopolized by the manufacturer, as described below.

The older a piece of equipment is, the more maintenance and repair it requires. I assume that a machine's service requirements grow linearly over time, so that a machine that is t years old requires $\alpha + \beta t$ units of service per unit time.[2] These growing maintenance requirements provide an incentive for the owner of a machine to replace the machine when it reaches a certain age.[3]

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[2]To put this in more concrete terms, the key assumption is that each year a machine ages means that it requires β more units of service in the following year. If $\alpha = 5$ and $\beta = 2$, a new machine would require 5 units of service during its first year of operation, a three-year-old machine would require 11 units of service during the next year of operation, and a six-year-old machine would require 17 units of service over the coming year.

[3]In fact, the machine is replaced in this model when its market value falls to zero. Of course, in the real world buyers differ in their needs, so when one user replaces an old piece of equipment, that machine typically finds its way to another customer, very likely one more willing to tolerate downtime or frequent repairs in exchange for reduced expenses.

Each buyer by assumption requires one machine for the indefinite future. The buyer chooses when to replace an aging machine with a new one in order to minimize the total life-cycle costs associated with having a machine. I denote by T the length of the replacement cycle, as optimally chosen by the customer.

The price for a new piece of equipment I denote by E, and the price of a unit of service I denote by p. How these prices are determined will be discussed below. For now, the buyer merely takes these prices as given, be they set by competition or by a monopolist, and chooses a replacement cycle to minimize costs.

The optimal replacement cycle depends on the following factors: (1) the extent to which older machines require additional service, as captured in the parameter ß; (2) the time value of money for the buyer, denoted by the interest rate r; (3) the price the buyer pays for a new piece of equipment, E; and (4) the price the buyer pays for service, p.

If the buyer keeps a machine for a length of time T, the total cost over that period of time is given by

$$C = E + p\int_0^T (\alpha + \beta t)e^{-rt}\,dt\,.$$

Performing this integration gives

$$C = E + \frac{\alpha p}{r}(1 - e^{-rT}) + \frac{\beta p}{r^2}(1 - e^{-rT}) - \frac{\beta p}{r} Te^{-rT}.$$

Choosing a replacement cycle of T requires that a new machine be purchased at date T, and again at date $2T$, $3T$, etc. Adding up the cost of all these machines, and the service for them, properly discounted, leads to a total cost associated with replacement cycle T of

$$M = \frac{C}{1 - e^{-rT}},$$

which can be written as

$$M = \frac{E}{1 - e^{-rT}} + \frac{\alpha p}{r} + \frac{\beta p}{r^2} - \frac{\beta p}{r} \frac{Te^{-rT}}{1 - e^{-rT}}. \qquad (1)$$

This is the total cost that the buyer seeks to minimize through suitable choice of the replacement cycle, T.

An expression can be obtained describing the optimal replacement cycle, by differentiating the total cost, M, with respect to the length of the replacement cycle, T, and setting the result equal to zero. Skipping over several

steps of algebra in this process, we obtain the following expression for the buyer's optimal replacement cycle T^*:

$$\frac{r^2}{\beta}\frac{E}{p} = e^{-rT^*} + rT^* - 1 . \qquad (2)$$

Notice that the optimal replacement cycle is determined by the parameters r and ß, and the variables E and p, as noted above. Since the expression on the right-hand side of equation (2) is increasing in T^*, it follows that T^* is larger if E is higher or if p is lower. Indeed, the replacement cycle is driven by the relative price of equipment and service, *Elp*. The more expensive is service relative to equipment, the shorter is the replacement cycle.

3. *Measuring Consumer Injury from Service Overcharges*

We are now ready to measure the consumer injury associated with service overcharges, i.e., associated with service being priced above competitive levels. In this model, the competitive price of service is $p = c$, so $p > c$ represents a supracompetitive service price.

In order to measure the cost to consumers of "traditional" monopoly overcharges for service, we must determine the extra cost the buyer must pay if service prices, p, rise.

The analysis is simplified if I can pause here and temporarily take a more abstract approach. We know that the total cost incurred by the buyer to keep one machine working properly indefinitely is given by M, which in turn depends upon E, p, and T, as shown in equation (1). This relationship can be written as $M = M(E,p,T)$.

The extra cost imposed on the consumer if p rises is given by

$$\left.\frac{dM}{dp}\right|_{MONO} = \frac{\partial M}{\partial p} + \frac{\partial M}{\partial T}\frac{dT}{dp},$$

recognizing that the buyer can and will adjust (decrease) T if p rises, i.e., $dT/dp < 0$. However, since T is chosen optimally by the buyer, $\frac{\partial M}{\partial T} = 0$, so (i.e., by the envelope theorem) we have

$$\left.\frac{dM}{dp}\right|_{MONO} = \frac{\partial M}{\partial p} = \frac{\alpha}{r} + \frac{\beta}{r^2} - \frac{\beta}{r}\frac{Te^{-rT}}{1-e^{-rT}}. \qquad (3)$$

Equation (3) applies if the price of service rises and there is no change in the price of equipment. This is the injury associated with traditional monopoly overcharges for service.

The point of this Appendix is that consumer injury from service overcharges is seriously attenuated in the presence of equipment competition, even if aftermarkets are securely monopolized. To show this, I compare the consumer injury measure just calculated with another measure of injury that applies when increases in the price of service, p, trigger decreases in the price of equipment, E, such as occur in the presence of equipment competition.

Accounting for adjustments in equipment prices, we get a different expression for consumer injury, namely

$$\left.\frac{dM}{dp}\right|_{COMP} = \frac{\partial M}{\partial p} + \frac{\partial M}{\partial E}\frac{dE}{dp} + \frac{\partial M}{\partial T}\frac{dT}{dp}.$$

Again the final term is zero since T is chosen optimally by the buyer, so the injury expression becomes

$$\left.\frac{dM}{dp}\right|_{COMP} = \frac{\partial M}{\partial p} + \frac{\partial M}{\partial E}\frac{dE}{dp}. \qquad (4)$$

Equation (4) applies if the price of equipment adjusts due to equipment competition when the price of service rises. This is the injury associated with aftermarket monopoly in the presence of foremarket competition.

Since $\frac{\partial M}{\partial E} > 0$, i.e., the consumer is harmed if equipment prices rise, and since $\frac{dE}{dp} < 0$, i.e., equipment prices in fact *fall* when service prices rise, we know that consumer injury from service overcharges is attenuated by equipment competition. I will now quantify that concept.

Specifically, I seek to calculate an injury ratio, which I define to be the ratio of consumer injury with equipment competition to consumer injury without equipment competition. If this ratio is 0.2, it tells us that equipment competition reduces consumer injury to 20% of what it would otherwise be. In terms of my model, the injury ratio is given by

$$J = \left.\frac{dM}{dp}\right|_{COMP} / \left.\frac{dM}{dp}\right|_{MONO},$$

which becomes

$$J = \left(\frac{\partial M}{\partial p} + \frac{\partial M}{\partial E}\frac{dE}{dp}\right) \Big/ \frac{\partial M}{\partial p}. \qquad (5)$$

To calculate this ratio, I need one further step of analysis in order to determine how much equipment prices fall when service prices rise, i.e., to calculate *dEldp*.

4. *Equipment Pricing with Aftermarket Monopolies*

Equipment competition drives the profits of sellers to zero (competitive levels), by assumption. The profits earned by the seller from a single piece of equipment are given by:

$$(E - K) + \int_0^T (p - c)(\alpha + \beta t)e^{-rt}\,dt\,.$$

Integrating this expression and setting it equal to zero gives

$$E = K - \alpha(p - c)\frac{(1 - e^{-rT})}{r} - \beta(p - c)\left(\frac{(1 - e^{-rT})}{r^2} - \frac{Te^{-rT}}{r}\right). \qquad (6)$$

The analysis is a bit tricky at this point, since the relationship between E and p depends upon T, and T itself adjusts when p rises. I must account for the fact that E and T are jointly determined by p. Equation (6) shows how competition determines E, given p and T. I also need to rely on equation (2) above, which shows how T is determined given E and p. Rewriting (2) here we have

$$\frac{r^2}{\beta}\frac{E}{p} = (e^{-rT} + rT - 1). \qquad (7)$$

Equations (6) and (7) together determine E and T jointly as functions of p.

The procedure now is to (slightly) increase p, and to use equations (6) and (7) together to see how E adjusts in order to calculate *dEldp*. This requires a number of steps of algebra, leading to the following expression:

$$\frac{r^2}{\beta}\frac{dE}{dp} = (e^{-rT} + rT - 1) - \frac{r(1 - e^{-rT})^2(\alpha + \beta T)}{\beta(1 - e^{-rT}) + mr(\alpha + \beta T)e^{-rT}}, \qquad (8)$$

where $m = (p - c)lp$ is the percentage markup over cost for aftermarket service.

5. *The Injury Ratio*

Finally, I am ready to report the injury ratio discussed in the text of the article. To this end, it is useful to note that, using (2), the traditional monopoly injury, which is the denominator in the injury ratio J, can be written as

$$\left.\frac{\partial M}{\partial p}\right|_{MONO} = \frac{\alpha + \beta T}{r} - \frac{E}{p(1 - e^{-rT})}.$$

This expression is obtained by differentiating M with respect to p and then using (2) to substitute at a suitable point.

Armed with equation (8), the expression in (5) for the injury ratio J can be calculated, albeit with quite a few steps of algebra, which I will not repeat here. The result is:

$$J=\frac{mr(\alpha+\beta T)^2(1-e^{-rT})e^{-rT}}{[(1-e^{-rT})+mr(\alpha+\beta T)e^{-rT}]\,[(\alpha+\beta T)(1-e^{-rT})-rE/p]}. \qquad (9)$$

The most important thing to note about this admittedly forbidding formula is the m in the numerator. If $m = 0$, then $J = 0$. In other words, if the markup on aftermarket services is small, the injury to consumers associated with increases in aftermarket prices is likewise very small.

In other words, if we start in a situation where aftermarket service prices are competitive, $p = c$, and we are asked how much injury consumers would suffer from a slight increase in p, the analysis here shows that the injury ratio is zero in this case. In other words, if aftermarket

prices are close to competitive levels, small increases in aftermarket prices lead to virtually no consumer injury, because of the compensating reduction in equipment prices generated by equipment competition.[4]

This is a telling observation. For example, Borenstein, MacKie-Mason, and Netz argue that aftermarket prices will be somewhat above competitive levels because manufacturers' incentives to keep aftermarket prices down are imperfect, since the reputation mechanism is imperfect.[5] To the extent that manufacturers have valuable reputations to protect (and those who can most credibly do so will have a competitive advantage), aftermarket prices will be only slightly above cost, and consumer injury will be slight indeed.

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[4]Economists will recognize this result as a special case of the general finding that small distortions starting from competition levels cause only second-order deadweight losses, combined with the fact that the consumer injury here is precisely the deadweight loss, since all aftermarket "profits" are returned to customers in the form of equipment discounts.

[5]*See* Borenstein, MacKie-Mason & Netz, *supra* note 1. For a general discussion of why reputations cannot perfectly substitute for explicit contractual protections, see Carl Shapiro, *Consumer Information, Product Quality, and Seller Reputation*, 13 BELL J. ECON. 20 (1982).

More generally, the injury ratio tends to be well below unity, telling us that aftermarket power tempered by foremarket competition is unlikely to be a very useful place to look if one takes the objective of the antitrust laws to be the protection of consumers.

Let me give some numerical examples using equation (9) to prove this point. I have adopted as my "base case" a situation where the interest rate is 10%, a new machine requires two units of service ($\alpha = 2$), and with each year of age a machine requires one more unit of service ($\beta = 1$), and in which equipment is about fifteen times as expensive as each unit of service, making it optimal for consumers to replace their equipment every six years *($T = 6$)*. Under these circumstances, if aftermarket services are priced 10% above cost, $p = 1.1c$, then the injury ratio is about 14%, i.e., the consumer injury from service overcharges is about one-seventh as much as the traditional monopoly injury, or six-sevenths of the potential injury is eliminated by virtue of equipment competition.

By way of comparison, if service is priced only-5% above cost, the injury ratio falls to about 7.5%, and if service is priced 20% above cost, the injury ratio is still only 24%.